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Original Research Article

Assessing the Effect of Research and Development Initiatives on Entrepreneurial and Administrative Roles of Managers of Multinational Corporation

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Abstract: This study assessed the influence of research and development (R&D) activities on managerial entrepreneurial and administrative roles in multinational companies (MNCs) operating in Nigeria. The study was necessitated by the increasing demand for organisations to align managerial capacities with innovation-led strategies as a way of enhancing worldwide competitiveness. Capitalizing on Innovation Diffusion Theory and Resource-Based View (RBV), the study employed an explanatory quantitative approach, employing structured questionnaires to obtain data from managerial personnel in chosen MNCs in Lagos and Abuja. Of the 300 distributed questionnaires, 267 were returned and checked, translating to a 89% rate of response. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed in data analysis. The findings revealed that R&D processes positively and significantly influenced entrepreneurial tasks ($\beta = 0.803$, $T = 28.503$, $p < 0.05$) and administrative tasks ($\beta = 0.732$, $T = 22.660$, $p < 0.05$) of managers, showing that investing companies in R&D provide greater managerial flexibility, innovativeness, and efficiency. The study concludes that R&D is a strategic means of increasing managerial efficiency and organisational sustainability in the competitive business environment of Nigeria. It recommends that MNCs institutionalize continuous R&D-compelled learning and encourage interdepartmental collaboration to enhance diffusion of innovation and operational quality. Furthermore, policymakers such as the Federal Ministry of Industry, Trade and Investment and NITDA ought to provide incentives to companies that invest in R&D-driven managerial development. The study contributes to the growing body of literature on strategic innovation management by underlining the role of R&D activities in facilitating managers to balance creativity and administrative order successfully in realizing organisational goals.

Keywords: Research and Development, Entrepreneurial Roles, Administrative Roles, Multinational Corporations, Innovation Management.

1. INTRODUCTION AND BACKGROUND INFORMATION

Research and development (R&D) has long been a critical driver of industrial competitiveness and managerial effectiveness across global economies. The United States, Germany, Japan and South Korea are always willing to spend over 2.5 percent of GDP on R&D annually. Such a large amount of funding allows managers in these nations to become entrepreneurial and are concentrated on innovation as well as undertaking administrative functions that are concentrated on efficiency (Ahlstrom *et al*., 2020; Donbesuur *et al*., 2020). To illustrate, the food manufacturing industry in Japan has taken advantage of the advent of R&D to initiate automated systems of quality-control. Instead, Germany has incorporated process innovations through R&D to improve efficiency and reduce waste in multinational companies (Schwab, 2021). By comparison, Nigeria allocated less than 0.3% of its GDP to R&D in 2022, which is way less than 0.8 and 1.2 spent in South Africa and Brazil respectively. This makes subsidiaries like Nestle Nigeria Plc to be dependent on imported technologies rather than local innovations (Bawalla and Rufai, 2021). Such a gap restricts the contribution of the Nigerian managers in the manufacturing sector, both in entrepreneurial and administration.

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The reason why Nigeria needs to address this imbalance immediately is evidenced by other nine countries. In 2022, the United States had over 600billion, China spent 440billion and Germany spent over 3percent of its GDP on R&D. Through these investments, there is a strengthening of the ability of managers to influence competitive industries (Wrede, Velamuri, and Dauth, 2020). Similarly, the high R&D intensity in South Korea has created an ecosystem whereby the manufacturing managers take advantage of the new technologies to conquer international markets. In Nigeria, though, the average growth in productivity in the manufacturing sector was 2.9 percent during the 2015-2023 period, in contrast to 6.5 percent in India and 5.1 percent in Turkey (World Bank, 2023). These numbers produce an effect of limiting the influence of R&D because Nigerian managers are unable to strike the balance between innovation and the daily administrative effectiveness (Salau *et al*., 2018; Kimhi *et al*., 2019; Adenekan and Jimoh, 2021).

The low impact of the low R&D investment is enhanced by the weak competitiveness in the manufacturing sector in Nigeria. Mapping In 2023, manufacturing accounted 8.4% of the GDP of Nigeria, a reduction of 9.2% of 2015, although the government was working towards increasing industrialization (National Bureau of Statistics, 2024). In comparison, manufacturing contributes 19% to the GDP of South Korea, 16% in Germany and 14% in Brazil, mostly due to the innovations that are developed through R&D and increase productivity (Giotis and Papadionysiou, 2022). Although a part of a global R&D intensive company, Nestle Nigeria Plc continues to rely on imported innovations as opposed to establishing local research collaborations, which would enhance the managerial ability of entrepreneurship and administration (Isaac *et al*., 2020). This fact increases the productivity difference, as well as the lack of competition in Nigeria within the African Continental Free Trade Area (AfCFTA).

History reveals that the weak impact of R&D on management in the food and beverage industry of Nigeria poses an issue. High cost of production and sluggish product development in many manufacturers between 2017 and 2020 was a result of depending on foreign knowledge and technology (Kimhi *et al.,* 2019). In comparison, South African and Egyptian firms that invested in domestic R&D enhanced managerial decision-making and were adjusted faster to regional market demands. This dependence on foreign innovation in Nigeria curtailed the entrepreneurial functions of managers in the introduction of new items and the responsibilities of managers in cost management and operations planning (Alsalim, 2020). This meant that corporations took longer to adapt to the consumer trends and the competitiveness was declining both locally and in the global market.

Managerial adaptation to Industry 4.0 is also formed under R&D. In developed economies - Sweden, Canada, Denmark - R&D investment allows managers to abandon routine work, to take up the job of innovation, strategic foresight, digital transformation (Güleryu, Duygoku, 2020; Henfridsson, Mathiassen, Svahn, 2014). Both manufacturing firms in Nigeria have low and disjointed levels of R&D funding, which is why managers are holding roles that are much older and cannot move technologies forward or handle change in an effective manner (Ahlquist and Birgisdottir, 2020). This prevents the efforts of Nigeria to place herself in global value chain and it contributes to reliance on imported managerial paradigms that are unsuited to local circumstances. These facts indicate a significant research gap. Although R&D has proven beneficial to managerial entrepreneurial and administrative functions in global studies to enhance competitiveness (Olive-Tomas, 2020; Syed *et al*., 2024), there is no information available on how R&D influenced managerial practices in Nigeria multinational manufacturing subsidiaries. The gap is critical in comprehending how R&D may help managerial contributions to change the manufacturing sector performance in a dwindling industry in Nigeria, where competitiveness, productivity and innovation are subjects of key concern. Based on the above the following research questions are formulated to guide this study:

i. What are the benefits and challenges of implementing research and development initiatives for managers of the selected multinational corporation?
ii. How does research and development influence the entrepreneurial roles of managers of the selected multinational corporation?
iii. What is the effect of research and development on the administrative functions of managers of the selected multinational corporation?

2. LITERATURE REVIEW/THEORETICAL FRAMEWORK

2.1 Research and Development (R&D)

R&D is systematic investigative activity to increase knowledge and develop new or improved products/processes (Tidd & Bessant, 2020); basic research is exploratory work aimed at expanding theoretical understanding (Martínez-Caro *et al*., 2020); applied R&D focuses on commercialisable solutions and process improvements (Donbesuur *et al*., 2020); and experimental development converts research into market-ready innovations (Bonnet & Westerman, 2020). R&D served as the engine for firm-level renewal and strategic choice, enabling managers to identify entrepreneurial opportunities and redesign administrative systems (Majhi, Mukherjee & Anand, 2023; Henfridsson, Mathiassen & Svahn, 2014). In multinational subsidiaries, R&D could be locally embedded or transferred from parent firms; where embedded, it strengthened local managerial discretion and market adaptation (Isaac *et al*., 2020; Martínez-Caro

et al., 2020). However, Nigerian firms historically underinvested in R&D, constraining invention pipelines and forcing managers to rely on imported solutions or imitation (Obiki-Osafiele *et al*., 2024; Abdullahi, Shehu & Usman, 2019). Empirical work suggested that effective R&D altered both strategic orientation and routine controls, yet how these dynamics unfolded in the multinational corporations remained under-examined and requires investigation.

2.2 Entrepreneurial Roles of Managers

Entrepreneurial role denotes initiative-taking to introduce new products/services (Mintzberg via Canbek, 2020); opportunity recognition is sensing market gaps for innovation (Tidd & Bessant, 2020); risk-taking involves allocating resources under uncertainty for potential gain (Bonnet & Westerman, 2020); and intrapreneurship is entrepreneurial activity inside an established firm (Olive-Tomas, 2020). R&D investments enabled managers to perform entrepreneurial roles by providing technical knowledge, prototypes, and evidence for commercial bets (Majhi *et al*., 2023; Martínez-Caro *et al*., 2020). In contexts where R&D was weak, managers defaulted to incremental changes or imitation rather than pursuing bold new product lines (Donbesuur *et al*., 2020; Giotis & Papadionysiou, 2022). In Nigeria, institutional challenges (funding, infrastructure, policy) constrained managers' ability to leverage R&D for entrepreneurial ventures, so entrepreneurial decisions were often risk-averse and operationally bounded (Bawalla & Rufai, 2021; Kimhi *et al*., 2019). Studies argued that when managers had reliable R&D outputs they exercised greater strategic discretion, but evidence for this effect within the multinational corporations remained scarce and merited empirical scrutiny.

2.3 Administrative Roles of Managers

Administrative roles include planning—setting targets and schedules (Gibbs, 1994); organising—structuring resources and processes (Bryman, 2016); controlling—monitoring performance and enforcing standards (Saunders, Lewis & Thornhill, 2019); and budgeting—allocating financial resources (Tidd & Bessant, 2020). R&D influenced administrative roles by changing procedures, control metrics and resource allocation rules, for instance through new quality standards or production processes (Henfridsson *et al*., 2014; Martínez-Caro *et al*., 2020). Where R&D produced process improvements, managers adjusted planning horizons, reallocated budgets to sustain innovation, and revised control systems to incorporate new KPIs (Majhi *et al*., 2023; Mugge *et al*., 2020). In Nigeria, weak R&D capacity often left administrative roles focused on cost containment and short-term problem solving rather than enabling long-term capability-building (Obiki-Osafiele *et al*., 2024; Olorunnisola *et al*., 2024). Consequently, R&D could either amplify administrative complexity or streamline routines depending on the strength of institutional support and managerial capability.

2.4 R&D, Capabilities and Managerial Dynamic Capabilities

Capabilities refer to firm abilities to coordinate resources and deploy processes (Tidd & Bessant, 2020); dynamic capabilities are the capacity to reconfigure assets in changing environments (Majhi *et al*., 2023); absorptive capacity is the ability to recognise and exploit external knowledge (Cohen & Levinthal concept cited via Martínez-Caro *et al*., 2020); and organisational learning denotes processes by which firms internalise knowledge (Henfridsson *et al*., 2014). R&D built technical and absorptive capacities that allowed managers to sense, seize and reconfigure opportunities—core tenets of dynamic capabilities research (Majhi *et al*., 2023; Henfridsson *et al*., 2014). For the multinational corporations in Nigeria, local R&D or adaptation of parent R&D could enhance managerial learning and decision quality, but only where structures and skills supported knowledge assimilation (Isaac *et al*., 2020; Donbesuur *et al*., 2020). Nigerian studies highlighted gaps in skill, funding and institutional support that limited absorptive capacity, thus weakening the translational link from R&D to managerial dynamic capabilities (Obiki-Osafiele *et al*., 2024; Bawalla & Rufai, 2021). This context suggested uneven capability outcomes that must be investigated empirically iwthin the context of the multinational corporations.

2.5 Manufacturing Context in Nigeria

Competitiveness denotes a firm's ability to sustain market share and profitability amidst rivals (Schwab, 2021); productivity is output per unit input in manufacturing operations (Martínez-Caro *et al*., 2020); technology adoption denotes the rate and depth at which firms integrate new tools (Mugge *et al*., 2020); and institutional constraints include infrastructure, policy and skills gaps that shape firm behaviour (Ahlstrom *et al*., 2020). Nigeria's manufacturing share of GDP stagnated in recent years and productivity growth lagged peers, constraining firms' ability to scale and absorb automation investments (Kimhi *et al*., 2019; Obiki-Osafiele *et al*., 2024). For multinational affiliates, exchange rate volatility, power costs and supply chain disruptions had previously raised unit costs and limited managers' bandwidth for strategic digital projects (Isaac *et al*., 2020; Olorunnisola *et al*., 2024). Comparative evidence suggested countries with higher automation and managerial capability enjoyed superior competitiveness and faster product innovation (Wrede *et al*., 2020; Donbesuur *et al*., 2020). Given these pressures, studying how Research and Development initiatives reshaped on entrepreneurial and administrative roles of managers within the context of the multinational corporations in Nigeria remained timely and under-examined.

2.6 Theoretical Synthesis

The theoretical synthesis integrates insights from multiple theoretical perspectives to provide a stronger understanding of how research and development shapes managerial roles in Nigeria. By drawing from

Contingency Theory and Resource Dependency Theory, it highlights the dynamic relationship between organisational strategies, environmental pressures, and managerial decision-making. This synthesis provides a foundation for examining how R&D initiatives affect both entrepreneurial and administrative roles of managers.

2.6.1 Contingency Theory

Contingency Theory (Fiedler 1964; Lawrence & Lorsch 1967 foundations; applied in management literature) assumes there is no one best way to manage—organisational effectiveness depends on fit between environment, structure and managerial practices (Gibbs, 1994; Tidd & Bessant, 2020). The theory posits that external contingencies (technology, market volatility, institutional context) determine appropriate managerial roles and decision rules; hence R&D's effect on entrepreneurial and administrative roles will vary by context. In the Nigerian manufacturing environment, contingency reasoning predicts that where infrastructure, skills and institutional support were favourable, R&D would enable entrepreneurial discretion and administrative redesign, whereas in constrained units R&D might produce limited role change or added complexity (Ahlstrom *et al*., 2020; Obiki-Osafiele *et al*., 2024). Contingency Theory therefore guides selection of moderator variables (e.g., infrastructure reliability, HR competence) in empirical models.

2.6.3 Resource Dependency Theory

Resource Dependency Theory (Pfeffer & Salancik, 1978 foundations; applied across strategic management studies) assumes organisations are interdependent with external actors for critical inputs and that managers act to manage these dependencies to secure resources and autonomy. The theory suggests R&D investments and resultant managerial roles are shaped by access to capital, skilled personnel, and parent-company support; managers will use R&D to reduce dependence or to create unique capabilities when resources allow (Isaac *et al.,* 2020; Donbesuur *et al*., 2020). In the case the multinational corporations in Nigeria, resource constraints (foreign exchange, imported inputs, power) influenced whether managers could deploy R&D outputs entrepreneurially or were forced into administrative conservation (Bawalla & Rufai, 2021; Olorunnisola *et al*., 2024). Resource Dependency thus helps explain cross-unit variation and informs policy levers to strengthen R&D impact.

Together Contingency and Resource Dependency theories provide complementary lenses: contingency explains when and where R&D will produce role changes (fit with environment), while resource dependency explains why managers choose particular R&D-driven strategies (availability and control of resources) (Tidd & Bessant, 2020; Ahlstrom *et al*., 2020). For empirical work of the multinational corporations, these theories recommend modelling direct effects of R&D on entrepreneurial and administrative roles and testing interactions with resource variables (budget, parent-firm R&D transfer) and contingency variables (power reliability, regulatory constraints, workforce skill). This combined framing supports regression models that assess both average effects and conditional effects across Nigerian operational contexts (Majhi *et al*., 2023; Obiki-Osafiele *et al*., 2024).

2.7 Research Gap

Although international literature has examined how R&D transforms managerial roles in advanced economies (Majhi *et al*., 2023; Martínez-Caro *et al*., 2020), evidence is limited on how R&D influenced the balance between entrepreneurial and administrative roles within Nigerian manufacturing subsidiaries. Nigerian studies documented infrastructural, institutional and resource limitations (Kimhi *et al*., 2019; Bawalla & Rufai, 2021) but did not quantify how these constraints moderated R&D's effect on managerial role enactment. Consequently, robust, context-specific quantitative evidence using regression models is lacking for the multinational corporations. This study will address that empirical gap and inform managerial and policy responses.

3. DETAILED MATERIALS AND METHODS

This section discussed the methodology that guided this study and it provided a structured approach to research philosophy, design, population, sampling, instruments, analysis, and ethics.

Research Design and Approach:

The research design was an explanatory research design which involves quantitative approach. Structured questionnaire was used to quantify numeric data of the impact of research and development initiatives on the entrepreneurial and administrative roles of managers. This study was informed by a positivist philosophy, which emphasizes both the numbers and the situational accounts toward answering very practical issues (Creswell and Creswell, 2017). Quantitative approach allows maintaining generalisability and offering a deeper level of context. Therefore, this study generated findings that were both statistically robust and contextually grounded (Esteban-Bravo & Vidal-Sanz, 2021).

Population and Sample Size:

The target population for this study comprised all staff and managers of the selected MNC, Lagos headquarters, with a total staff strength of 773 employees (NSE Prospectus, 2021). This included 48 top-level managers, 142 middle-level managers, and 583 lower-level managers. These groups represented the unit of analysis, as they were directly involved in entrepreneurial and administrative influenced by research and development initiatives. Table 1 presents the distribution of the population.

Table 1: Population Distribution of the selected MNC

Category	Code	Number of Staff
Top-Level Managers	TLM	48
Middle-Level Managers	MLM	142
Lower-Level Managers	LLM	583
Total		**773**

Since studying all 773 employees was impractical, a representative sample was drawn. Using Yamane's (1967) formula at a 95% confidence level and 5% margin of error, the sample size was calculated as 260 respondents. This ensured statistical adequacy and minimised sampling error. This stratified distribution ensured representativeness across managerial levels, thereby improving validity. Table 2 presents the sample size distribution.

Table 2: Sample Size Distribution

Category	Population	Sample Size
Top-Level Managers	48	16
Middle-Level Managers	142	48
Lower-Level Managers	583	196
Total	**773**	**260**

Sampling Techniques:

This study employed a stratified random sampling technique for the quantitative survey. The population was divided into strata (top, middle, and lower-level managers), and proportional allocation was applied to ensure fair representation. From each stratum, respondents were randomly selected using computer-generated numbers. This method was superior to simple random sampling, as it prevented over-representation of lower-level managers who made up the bulk of the population. The choice of purposive sampling was justified because it allowed the researcher to deliberately target respondents with relevant expertise and experiences in research and development initiatives.

Research Instruments:

A structured questionnaire was adopted for this study. The questionnaire was designed with three sections: demographic information, Entrepreneurial roles, and Administrative roles in relation to research and development initiatives. Responses were measured using a 5-point Likert scale ranging from *Strongly Agree (5)* to *Strongly Disagree (1)*. Table 3 presents the constructs and number of items included.

Table 3: Constructs and Questionnaire Items

Construct	No. of Items	Sources
Research and Development Initiatives	3	Canbek, 2020; Gibbs, 1994; Henfridsson *et al*., 2014; Kimhi *et al*., 2019; Olorunnisola *et al*., 2024
Entrepreneurial Roles	3	Van den Oever & Martin, 2015; Giotis & Papadionysiou, 2022; Tidd & Bessant, 2020
Administrative Roles	5	Henfridsson, Mathiassen & Svahn, 2014; Tebekin & Vasilyuk, 2019; Martínez-Caro *et al*., 2020; Bonnet & Westerman, 2020; Majhi *et al*., 2023

Method of Data Analysis:

The quantitative data collected from the questionnaires were coded and analysed using Statistical Package for the Social Sciences (SPSS v26). Descriptive statistics (frequencies, means, and percentages) summarised respondents' demographics, while inferential statistics, particularly the use of structural and measurement models (i.e. Smart PLS, 4.5.0) to examine the relationship between research and development initiatives and entrepreneurial and administrative roles. Smart PLS was chosen because it revealed both the strength and direction of relationships between independent and dependent variables, making it more suitable than correlation analysis alone.

Ethical Considerations:

The study adhered strictly to ethical guidelines. Prior to data collection, approval was obtained from the researcher's institutional ethics committee. Informed consent forms were distributed to participants, clearly stating the purpose of the study, voluntary participation, and the right to withdraw at any stage. Respondents' confidentiality was guaranteed by assigning codes instead of names. All data were stored securely in password-protected files and accessible only to the researcher. Sensitive organisational information was treated with strict confidentiality to prevent misuse. These safeguards ensured that the research upheld integrity, transparency, and respect for human dignity.

4. DATA ANALYSIS AND DISCUSSIONS

The unit of analysis for this study comprised 260 staff and management of the selected MNC. This implies that two hundred and sixty (260) copies of questionnaire were distributed to staff and management of the selected MNC and out of which, only two hundred and thirty-five (235) representing 90% response rate were returned as shown in Tables 4 and Figure 1. The copies of the administered questionnaire and the response rate are presented accordingly in Table 4.

Table 4: Respondents' Response Rate

Sample Size	Number	Percentage (%)
Correctly filled and Returned	235	90%
Not Returned and not completely filled	25	10%
Total	260	100%

Tables 4 and 5 represent the response rate from the questionnaire administered to the target respondents for the study. The result presented was based on the responses from the questionnaire that were correctly filled and returned. The response rate was further broken down according to the levels of management in the selected MNC (See Figure 1).

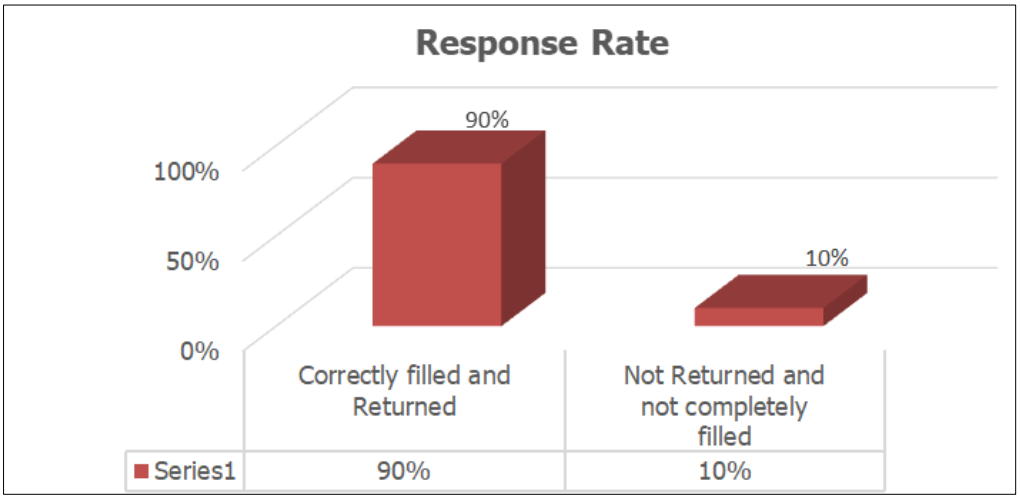

Figure 1: Distribution and retrieval rate of Questionnaire

Table 5: Breakdown of Retuned Questionnaire

S/N	Status	Copies Distributed	Copies Retrieved	(%) of Copies Retrieved
1	Top level Management	10	8	80%
2	Middle level Management	45	37	82%
3	Lower level Management	205	190	93%
	Total	**260**	**235**	**90%**

The data in Table 5 outlines the response rate to questionnaires distributed across different management levels of a remarkable MNC, Lagos. Out of 260 total questionnaires distributed, 235 were retrieved, yielding an overall response rate of 90%. The breakdown shows that lower-level management had the highest retrieval rate at 93% (190 out of 205), followed by middle-level management at 82% (37 out of 45), and top-level management at 80% (8 out of 10). This high response rate, particularly from lower and middle management and this suggests strong participation and engagement with the survey. This also made the data reliable and reflective of the employees' perspectives across different management tiers.

4.2 Demographic Data

Table 6: Demographic distribution of respondents (n =235)

Gender	Percentage (%)
Male	68.4%
Female	31.6%
Total	**100%**
Age	
Below 30 years	29.1%
30-40 years	40.3%

Gender	**Percentage (%)**
41-50 years	23.2%
51 years and above	7.4%
Total	**100%**
Marital Status of the Participants	
Single	29.9%
Married	65.7%
Others	4.4%
Total	**100%**
Highest Educational Qualification of the Participants	
SSCE	7.1%
OND	10.7%
Bachelors' Degree	68.4%
Masters' Degree	10.7%
Others	3.1%
Total	**100%**
Years of experience [Spent] in the organisation	
1-5years	11.8%
6-10years	48.6%
11-15years	25.4%
Over 16yrs	14.2%
Total	**100%**

Table 6 presents the demographic distribution of the 235 respondents. The majority were male (68.4%), while female respondents accounted for 31.6%. In terms of age, 40.3% were between 30–40 years, followed by 29.1% below 30 years, 23.2% aged 41–50 years, and 7.4% above 51 years. Regarding marital status, 65.7% were married, 29.9% single, and 4.4% categorized as others. Educationally, most participants held a Bachelor's degree (68.4%), while 10.7% each possessed OND or Master's degrees, 7.1% SSCE, and 3.1% other qualifications. Concerning work experience, 48.6% had 6–10 years, 25.4% had 11–15 years, 14.2% had over 16 years, and 11.8% had 1–5 years of experience in their organisations, showing a relatively well-educated and experienced workforce. Summarily, the demographic profile indicates that the study respondents were predominantly educated, married males in their productive age bracket with substantial work experience in their respective manufacturing organisations.

4.2 Descriptive Statistics

The descriptive statistics reveal that research and development initiatives has significantly enhanced both entrepreneurial and administrative among managers in multinational corporations (MNCs). The mean scores indicate strong agreement among respondents on the positive influence of research and development initiatives, with relatively low standard deviations showing consistency in their views.

Table 7: Mean Scores and Standard Deviation on Research and development initiatives and Its Impact on Entrepreneurial and administrative roles of managers in MNCs (n = 235)

Variable	**Mean ($\bar{x}$)**	**Standard Deviation (SD)**	**Interpretation**
Research and development initiatives	4.103	0.118	High level of adoption
Entrepreneurial Roles	4.001	0.123	Highly improved decisional flow
Administrative Roles	4.424	0.100	Highly improved decisional flow
Aggregate Mean	4.251	0.182	High influence overall

Table 7 indicates that research and development (R&D) initiatives have a strong positive effect on the entrepreneurial and administrative roles of managers in multinational corporations (MNCs). The mean score for R&D initiatives ($\bar{x}$ = 4.103, SD = 0.118) signifies a high level of adoption, reflecting managers' active engagement in research-driven strategies for organisational improvement. Entrepreneurial roles also recorded a high mean ($\bar{x}$ = 4.001, SD = 0.123). This shows that R&D activities enhance creativity, opportunity recognition, and innovative business decision-making among managers. Similarly, administrative roles exhibited a very high mean score ($\bar{x}$ = 4.424, SD = 0.100), indicating improved efficiency, coordination, and leadership effectiveness in managerial processes. With an aggregate mean of 4.251 and SD = 0.182, the results suggest that consistent investment in R&D substantially strengthens both the entrepreneurial and administrative capacities of MNC managers, leading to better strategic outcomes and sustained competitive advantage.

4.3 Analysis of Research Question:

This section addresses the research question, *"What are the benefits and challenges of implementing research and development initiatives initiatives for managers in the selected multinational corporation (MNC)?"* The analysis examines how research and development (R&D) initiatives enhance managerial creativity, productivity, and strategic improvement, while identifying key barriers that limit their successful implementation in multinational corporations (MNCs). Table 8 below presents the major benefits and challenges encountered by managers in the selected MNCs when adopting R&D-driven practices.

Table 8: Benefits and Challenges of Implementing Research and Development Initiatives for Managers in the Selected MNCs

Benefits	Challenges
1. Accelerated product and service innovation	1. High research funding requirements
2. Enhanced market adaptability	2. Slow return on investment
3. Strengthened global competitiveness	3. Inadequate collaboration between departments
4. Improved data-driven decision-making	4. Limited access to advanced research tools
5. Increased employee knowledge and creativity	5. Difficulty in sustaining continuous innovation

The findings reveal that R&D initiatives provide significant managerial advantages, including faster innovation cycles, stronger market responsiveness, and improved strategic competitiveness. Managers benefit from data-supported decisions and enhanced team creativity, which collectively boost organisational performance. However, the high cost of research, slow financial returns, weak inter-departmental coordination, and limited access to research tools often constrain sustainability. These results imply that for MNCs to fully maximize the impact of R&D, they must strengthen internal collaboration, invest in modern research infrastructure, and create a long-term innovation culture that balances cost, knowledge sharing, and continuous improvement.

4.4 Test of Research Hypotheses

This study employed both structural and measurement model predictions to evaluate the impact of research and development initiatives on entrepreneurial and administrative roles of managers in multinational corporations. Using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, path coefficients and the bootstrapping technique with 5,000 samples were applied in line with Bollen and Stine (1992) and Liao, Tang, and Shim (2022). All constructs in the measurement model were reflective and exceeded the minimum recommended factor loading of 0.70, as supported by Fornell (1981). The items that fell below this threshold were minimal and excluded to maintain validity. The hypothesis tested was:

H_0: Research and development initiatives have no significant effect on the entrepreneurial and administrative roles of managers in the selected multinational corporation [MNC]

To evaluate this, research and development initiatives were treated as the independent variable, while one dependent variable was considered: entrepreneurial and administrative roles of managers. Each construct was assessed using a five-point Likert scale. Figures 2 and 3 illustrate the model structure, with Table 9 presenting the factor loadings, all of which exceeded 0.70, affirming the model's reliability and construct validity based on Bagozzi and Yi (1988) and Thakkar (2020).

Table 9: Factor Loadings and Measurement Model Indicators

Constructs	Factor Loading	Composite Reliability	AVE	Cronbach's Alpha	No. of Indicators
Research and development initiatives	0.822	0.800	0.688	0.721	5
Entrepreneurial Roles	0.781	0.810	0.709	0.793	5
Administrative Roles	0.705	0.764	0.704	0.777	5

Table 9 shows that all constructs demonstrate strong reliability and validity, with factor loadings ranging from 0.705 to 0.822, indicating that each item adequately represents its respective construct. The composite reliability values between 0.764 and 0.810 confirm internal consistency, while Cronbach's alpha values ranging from 0.721 to 0.793 further validate the reliability of the measurement model. The Average Variance Extracted (AVE) values, which fall between 0.688 and 0.709, exceed the acceptable threshold of 0.50, confirming good convergent validity. Overall, these results indicate that research and development initiatives, entrepreneurial roles, and administrative roles are well-measured and statistically sound constructs, reflecting strong relationships and dependable indicators within the model.

(a) Evaluation of the Inner, Path Coefficients (β) and T-Statistics Estimation

The inner structural model was used to assess the impact of research and development initiatives on entrepreneurial and administrative roles of managers in multinational corporations. Following Méndez-Suárez (2021), bootstrapping with 5,000 subsamples was

applied to determine the significance of the path coefficients. Path coefficients were calculated using the PLS algorithm, providing standardised β values used to assess the strength of the relationships. The results, as shown in Table 10 and visualised in Figures 2 and 3, confirmed statistically significant relationships between the varables.

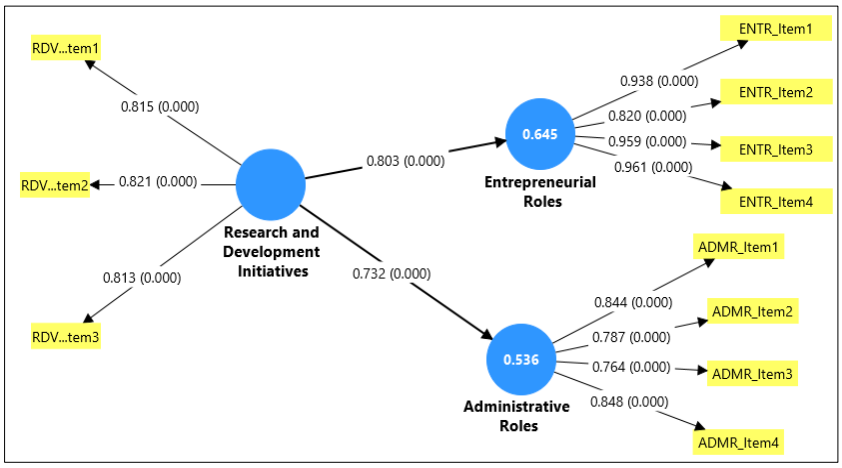

Figure 2: Predictive relevance (Path co-efficient and T-values) of research and development initiatives on entrepreneurial and administrative roles of managers

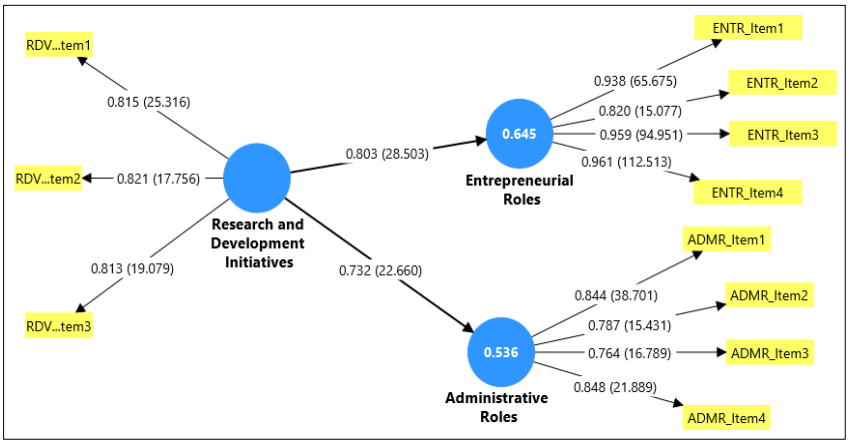

Figure 3: Predictive relevance (Path co-efficient and P-values) of research and development initiatives on entrepreneurial and administrative roles of managers

Figures 5 and 6 depict the path coefficient histograms that demonstrate how research and development initiatives influences the entrepreneurial and administrative roles of managers in multinational corporations in Nigeria.

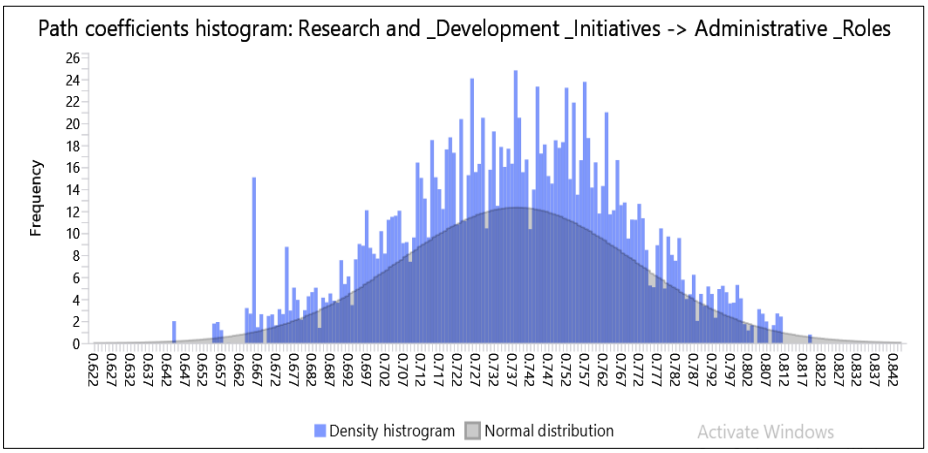

Figure 4: Path Co-efficient Histogram for research and development initiatives and administrative roles

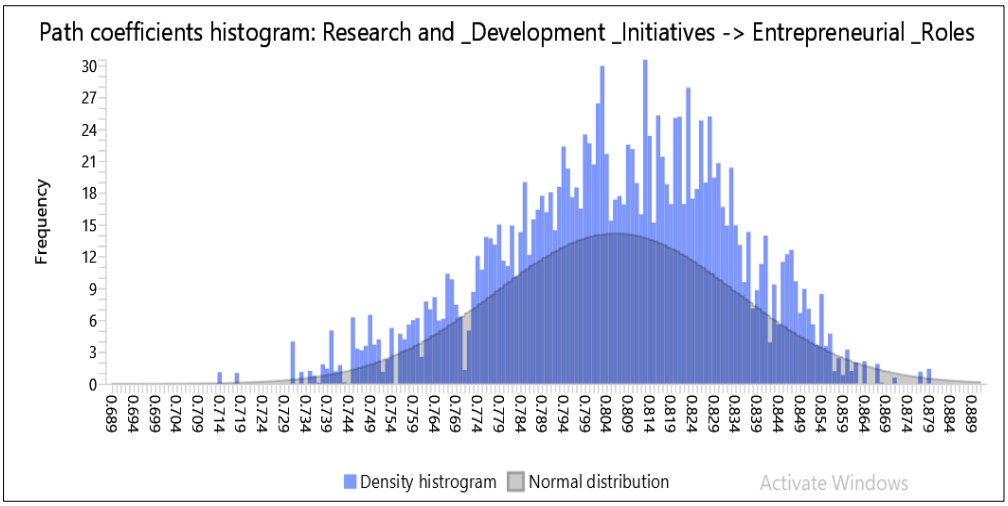

Figure 5: Path Co-efficient Histogram for research and development initiatives and administrative roles

Table 10: Path Coefficients for research and development initiatives on entrepreneurial and administrative roles of managers

Variables and Cross Loading	Path Co-efficient	Std. Dev. (STDEV)	R Square	Adj. R Square	T-Statistics (O/ STDEV	P Values
Research and development initiatives => Entrepreneurial roles of managers	0.803	0.068	0.645	0.640	28.503	0.000
Research and development initiatives => Administrative roles of managers	0.732	0.055	0.536	0.531	22.660	0.000

The results in Table 10 indicate that research and development (R&D) initiatives have a strong and positive effect on both entrepreneurial and administrative roles of managers in multinational corporations (MNCs). Specifically, the path coefficient for the influence of R&D initiatives on entrepreneurial roles is 0.803 with a t-statistic of 28.503 ($p < 0.001$), explaining about 64.5% ($R^2 = 0.645$) of the variance, while its effect on administrative roles shows a slightly lower but still substantial path coefficient of 0.732 and t-statistic of 22.660 ($p < 0.001$), accounting for 53.6% ($R^2 = 0.536$) of the variation. These findings imply that MNCs that invest in R&D are more likely to develop managers with enhanced entrepreneurial vision, problem-solving capacity, and innovation-driven administrative efficiency. This reinforces the need for MNCs operating in Nigeria and similar developing economies to embed continuous R&D strategies into managerial development programs to foster creativity, adaptive leadership, and data-informed decision-making, thereby strengthening competitiveness and sustainability in dynamic global markets.

(c) Discriminant Validity – Fornell Larcker Criterion

Discriminant	[1]	[2]	[3]	Q^2predict
Research and development initiatives [1]	0.888			0.201
Entrepreneurial roles of managers [2]	0.760	0.751		0.277
Administrative roles of managers [3]	0.722	0.700	0.683	0.314

The Fornell-Larcker Criterion in Table (c) shows that the square roots of the AVE values for each construct—research and development initiatives (0.888), entrepreneurial roles (0.751), and administrative roles (0.683)—are all higher than their corresponding inter-construct correlations, confirming adequate discriminant validity. This means that each construct is statistically distinct and measures a unique aspect of managerial functions within MNCs. The Q^2predict values of 0.201, 0.277, and 0.314 indicate good predictive relevance, suggesting that the model can reliably forecast managerial role outcomes. This finding implies that research and development initiatives independently and strongly contribute to shaping both entrepreneurial and administrative competencies among managers, without overlap or measurement bias, which enhances the robustness of the study's structural model.

(d) The Common Method Bias (CMB)

Table 11 reveals that the Variance Inflation Factor (VIF) values for research and development initiatives (2.533), entrepreneurial roles (2.600), and administrative roles (2.853) are all below the benchmark of 3, indicating that the dataset is free from common method bias (CMB). The variance explained, standing at 62.827%, exceeds the 50% threshold, confirming the robustness and internal consistency of the measurement model. This demonstrates that the observed relationships

among the constructs are not influenced by measurement errors or multicollinearity. Consequently, the findings can be confidently interpreted as genuine reflections of how research and development initiatives impact managerial roles within MNCs.

Table 11: Common Method Bias for Coefficients for research and development initiatives on entrepreneurial and administrative roles of managers

SN	Variables	VIF [<3]	Decision	Variance Factor in % [> 50%]
1	Research and development initiatives [1]	2.533	Free of CMB	62.827
2	Entrepreneurial roles of managers [2]	2.600	Free of CMB	
3	Administrative roles of managers [3]	2.853	Free of CMB	

(e) Evaluation of the Model Fitness

Absolute, incremental, and parsimony fit indices were used to assess the model fit of the correlation between research and development initiatives, entrepreneurial roles and administrative roles of managers as suggested by Hair (2021). The value of the Root Mean Square Residual (RMSR = 0.060) is lower than the acceptable value (0.08) and it is clear the Goodness-of-Fit Index (GFI = 0.963) is very close with the suspected model and the data observed. Incremental fit measures such as Normed Fit Index (NFI = 0.943) and Comparative Fit Index (CFI = 0.953) test scores were above 0.90 which confirmed the strength of the model and improvement compared to the baseline model. Moreover, the models are appropriate and simple, which is confirmed by the relative Chi-square (CMIN/DF<3) and Parsimony Comparative Fit Index (PCFI>0.50). A combination of these indices makes it clear that research and development initiatives has a significant and strong predictive power of the changes in the entrepreneurial and administrative roles of managers in multinational companies in Nigeria.

5. DISCUSSIONS AND CONCLUSION

Table 8 reveals that research and development (R&D) undertakings affect and impact the entrepreneurial and administrative functions of managers in multinational corporations (MNCs) in Nigeria in a significant and positive way. The path coefficients of 0.803 (R 2 = 0.645, T = 28.503, p = 0.001) and 0.732 (R 2 = 0.536, T = 22.660, p = 0.001) were registered in R&D initiatives of entrepreneurial roles and administrative roles, respectively. These findings show that managers that participate in R&D based actions are more innovative, aggressive, and effective in decision making and administrative organisation. Continued investment in R&D thus increases the capacity of managers to detect new business opportunities, resource management and application of innovative solutions that advance competitiveness in organisations.

The results are in line with the studies by Donbesuur *et al*., (2020), who highlighted the idea that technological and organisational innovation enhances the performance of international performance through the increased managerial flexibility and resource efficiency. In the same line, Ahlstrom *et al.,* (2020) believed that successful management of technological and institutional change enables managers to make strategic decisions in dynamic business conditions, which are informed. Alsalim (2020) established that managerial innovation and operational efficiency in complex organisations is encouraged by information technology management. Bawalla and Rufai (2021) noted that technological changes in Nigeria have beneficial impacts that transform human-resource and managerial practices, management performance and accountability.

The implication of the same on Nigerian MNCs is great. Companies need to empower their research and development departments and train managers to be innovation oriented so that they can use analytical tools and electronic technology in their day to day operations. A culture of constant experimentation will enable managers to be able to adjust faster to market changes and regulatory changes. This strategy is aligned with Tidd and Bessant (2020), who stated that innovation management based on systematic R&D mechanisms is a critical step towards long-term competitiveness. All in all, investing in R&D is not only a driver of organisational development, but also managerial agility, creativity, and administrative efficiency within the multinational organisations within the changing digital economy of Nigeria.

6. Recommendations and Policy Implications

Research and development (R&D) initiatives significantly increase entrepreneurial as well as administrative functions of managers in multinational corporations (MNCs) operating in Nigeria. Thus, HR managers and corporate executives need to create well-organised R&D systems directly contributing to the managerial innovation and decision-making. The R&D unit should collaborate with the management -training teams to develop continuous, innovative learning modules that can enhance the ability of managers in using technologies, data analysis, and strategic planning. Also, the Federal Ministry of Industry, Trade and Investment along with NITDA and the National office of technology acquisition and promotion (NOTAP) ought to implement policies that provide tax incentives and grants to MNCs who invest in managerial R and D as well as technology innovation. These actions will assist managers to incorporate new technologies into administrative and entrepreneurial roles, which would enhance efficiency, flexibility, and competitiveness of MNCs in the fast changing digital economy of Nigeria.

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