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Sequence of Manuscript

I. Title page
II. Abstract (150-250 words)
III. Keywords (3-5)
IV. Introduction
V. Literature Review
VI. Methodology
VII. Results and Discussion
VIII. Conclusion and Recommendations
IX. References (APA 7th Edition)
X. Appendices (if necessary)
XI. Author Biographies (optional)

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DETERMINANTS OF BIG DATA ANALYTICS ADOPTION AMONG FIRMS IN THE HOSPITALITY INDUSTRY IN NIGERIA

AKINYEMI ADEBAYO MUIDEEN
DAGWOM YOHANNA DANG
ABDULLAHI YAU

ABSTRACT

This study investigates the determinants of Big Data Analytics (BDA) adoption among hospitality firms in Abuja, Nigeria. Anchored on the Technology–Organization–Environment (TOE) framework, the study focuses on three key internal factors: perceived benefits, top management support, and IT infrastructure. A quantitative research approach was adopted, utilizing survey and correlational designs. Primary data were collected from 100 hospitality firms using a structured questionnaire, and the results were analyzed using Ordinary Least Squares (OLS) regression. The findings reveal that while top management support and IT infrastructure significantly and positively influence BDA adoption, perceived benefits, though positively related, have an insignificant effect. These results suggest that internal capacity and leadership commitment are more critical than mere awareness of BDA advantages. The study recommends stronger executive involvement, investment in IT capabilities, and strategies to bridge the gap between perceived benefits and implementation. Limitations and suggestions for future research are also provided to guide further exploration in this area.

Keywords: *Big data analytics, Technology–Organization–Environment (TOE), Hospitality industry, Nigeria*

1. Introduction

The rapid advancement of digital technologies has revolutionized data generation, analysis, and utilization across industries. Among these innovations, Big Data Analytics (BDA) has emerged as a pivotal tool, enabling organizations to make informed decisions, enhance service delivery, and sustain competitive advantage. BDA leverages large volumes of structured and unstructured data to extract actionable insights (Maroufkhani et al., 2023). The hospitality industry, characterized by high-volume customer transactions and service variability, is particularly poised to benefit from BDA applications in areas such as demand forecasting, customer preference analysis, pricing optimization, and experience personalization. Despite this potential, adoption of BDA remains uneven across firms in the Nigerian hospitality sector, necessitating a deeper exploration into the determinants that shape firms' intentions and decisions to integrate BDA into their operations.

The application of BDA in operations and customer engagement processes can support hospitality firms in Nigeria to address key sectoral challenges such as low operational efficiency, inconsistent service delivery, and inadequate customer engagement strategies. Studies in other industries, such as logistics and supply chain management, have shown that BDA adoption is influenced by various organizational and technological factors, particularly perceived benefits, top management support, and IT infrastructure (Lai et al., 2018). These factors not only determine the readiness of firms to embrace BDA but also shape their ability to sustain data-driven innovation. Given Nigeria's emerging digital ecosystem and the growing recognition of data-driven strategies in service-oriented industries, understanding these determinants within the hospitality context is both timely and relevant.

Despite the widespread discourse on digital transformation in service sectors, there remains a notable gap in empirical research focusing on BDA adoption in hospitality firms within developing economies such as Nigeria. Prior studies have largely concentrated on the logistics and supply chain domain, where factors like perceived benefits and managerial support have been identified as significant predictors of BDA adoption (Chen et al., 2012; Lai et al., 2018). These findings suggest that a similar pattern may exist in the hospitality sector, but contextual factors such as infrastructure readiness, managerial capacity, and industry-specific data challenges

warrant a sector-focused investigation. Anecdotal evidence suggests that many hospitality firms in Nigeria underutilize their available customer and operational data, either due to lack of technical capacity or insufficient organizational commitment. This inefficiency undermines their ability to leverage data for strategic gains such as improving service quality, enhancing customer satisfaction, or achieving operational cost savings (Dimitra & Naoum, 2022).
Moreover, studies have indicated that perceived benefits, such as increased decision-making efficiency, customer satisfaction, and competitive advantage, are often the strongest motivators for BDA adoption (Gunasekaran et al., 2017; Rai, Patnayakuni, & Seth, 2006). However, even when such benefits are recognized, adoption may be hindered by weak IT infrastructure or lack of strategic commitment from top executives. This is particularly relevant in the Nigerian hospitality industry, where many firms operate under constrained technological environments and often lack the institutional frameworks needed to support complex digital innovations. Therefore, while the promise of BDA is substantial, its realization is contingent on how firms perceive its value, the leadership's readiness to support it, and the existing technological capacity to operationalize it.

The objective of this study is to examine the determinants of Big Data Analytics adoption among firms in Nigeria's hospitality industry. Specifically, the study aims to evaluate how perceived benefits, top management support, and IT infrastructure influence the likelihood of BDA adoption. Drawing insights from the Technology–Organization–Environment (TOE) framework and the innovation diffusion theory (Tornatzky & Fleischer, 1990; Rogers, 1995), the study seeks to contribute empirical evidence to an underexplored domain and inform data-driven transformation strategies among Nigerian service firms. In order to systematically evaluate these factors, the study will employ regression analysis, a statistical technique suitable for testing linear relationships between a dependent variable (BDA adoption) and multiple independent variables (perceived benefits, top management support, and IT infrastructure).

Based on the stated objectives, the following research hypotheses are proposed:

H1: Perceived benefits of Big Data Analytics have no significant effect on the adoption of BDA by firms in the hospitality industry in Nigeria.
H2: Top management support has no significant effect on the adoption of BDA by firms in the hospitality industry in Nigeria.
H3: IT infrastructure has no significant effect on the adoption of BDA by firms in the hospitality industry in Nigeria.

This study holds significant practical and academic relevance. First, it will provide empirical insight into the strategic, technological, and organizational enablers of BDA adoption in Nigeria's hospitality industry, an area that has received limited scholarly attention. Given that prior research, such as that of Lai et al. (2018), has demonstrated the pivotal role of top management support and technological readiness in driving BDA in other industries, validating these relationships within the hospitality context can expand the theoretical generalizability of existing models. Additionally, by focusing on a service-driven and customer-intensive sector, the study aligns with calls for more sector-specific investigations into digital transformation and analytics adoption in emerging markets.

For practitioners, the findings of this study could inform managerial decisions and investment strategies around digital transformation. For instance, understanding that perceived benefits serve as the most critical determinant of adoption (as shown in studies like Gunasekaran et al., 2017), hospitality firms may be encouraged to invest in pilot analytics projects that showcase tangible value before pursuing full-scale implementation. Similarly, insights about the influence of top management support could foster more deliberate involvement of senior executives in digital innovation initiatives. In addition, the study's focus on IT infrastructure emphasizes the importance of both hardware capabilities and skilled personnel in supporting BDA projects, which is particularly critical for firms with legacy systems or limited technological expertise.

The scope of this study is limited to firms operating within Nigeria's hospitality sector, including hotels, guest houses, and service apartments with formal structures. The analysis will be restricted to organizational-level determinants and will not account for environmental moderators such as government policy or industry regulation. While this scope narrows the generalizability of the findings, it allows for a focused exploration of firm-level factors that are more amenable to strategic and managerial control. The study also acknowledges that BDA adoption is a multi-stage process that evolves over time; however, the focus here is on the intention to adopt, not post-adoption outcomes or usage intensity.

As BDA continues to redefine how service firms create value, the imperative for Nigerian hospitality firms to embrace data-driven innovation becomes increasingly urgent. Understanding the determinants of BDA adoption, especially those within managerial influence, will not only guide strategic resource allocation but also position firms to compete more effectively in a digitally driven global economy. By focusing on perceived benefits, top management support, and IT infrastructure, this study provides a

grounded framework for explaining BDA adoption in an industry that is ripe for transformation but often constrained by limited resources and strategic inertia.

2. Literature Review

2.1 Conceptual Review

2.1.1 Big Data Analytics

Big Data Analytics (BDA) refers to the process of examining large and complex datasets, known as big data, to uncover hidden patterns, correlations, customer preferences, and market trends that can inform strategic decisions. The concept combines two main components: big data and analytics. Big data represents the vast amount of structured, semi-structured, and unstructured information generated from various digital sources such as social media, websites, mobile apps, and transaction records. Analytics, on the other hand, involves the systematic application of statistical, computational, and visualization techniques to derive insights from these datasets (Wamba et al., 2017).

The defining characteristics of big data highlight its scale, complexity, and potential impact. In the hospitality industry, BDA provides firms with the capability to track customer behavior, forecast demand, optimize pricing, and improve service personalization. For example, by analyzing customer booking patterns and feedback, hotels can predict peak seasons, adjust room rates dynamically, and enhance guest satisfaction. According to Gandomi and Haider (2015), the BDA process typically involves two stages: data management (including acquisition, cleaning, and integration) and analytics (encompassing modeling, interpretation, and visualization). With the aid of BDA tools, hospitality firms can gain real-time visibility into operations, uncover inefficiencies, and enhance decision-making across departments. Additionally, the integration of BDA into customer relationship management allows for personalized marketing and loyalty programs, which are crucial for competitive positioning.

Despite its growing adoption globally, the use of BDA in the Nigerian hospitality industry remains limited. Barriers such as inadequate IT infrastructure, limited management awareness, and resource constraints hinder widespread adoption. However, the increasing digitization of customer interactions and the availability of cloud-based analytics platforms suggest a significant opportunity for Nigerian hospitality firms to leverage BDA to drive operational and strategic transformation.

2.1.2 Determinants of BDA

Numerous studies have identified organizational, technological, and environmental factors as critical determinants of BDA adoption (Lai, Sun, & Ren, 2018; Maduku et al., 2016). In the context of this study, three firm-level drivers, perceived benefits, top management support, and IT infrastructure, are examined to understand their influence on the decision to adopt BDA. These factors are adapted from the Technology-Organization-Environment (TOE) framework and supported by empirical evidence from innovation diffusion research.

Perceived benefits refer to the extent to which an organization believes that adopting BDA will improve its performance, reduce costs, and enhance decision-making processes. In the hospitality industry, these benefits may include operational efficiency, enhanced customer experience, better resource utilization, and increased profitability. Firms that recognize these advantages are more likely to invest in BDA tools and technologies. According to Rai et al. (2006), the perception of tangible and intangible gains is one of the most important predictors of technology adoption decisions at the firm level. Lai et al. (2018) found that perceived benefits had the strongest influence on BDA adoption intentions among logistics firms. This finding aligns with earlier research showing that anticipated improvements in service delivery, competitiveness, and responsiveness are key motivators for firms considering BDA. In hospitality, real-time analytics can support revenue management, improve customer segmentation, and optimize staffing decisions based on demand patterns, all of which contribute to superior performance.

Moreover, perceived benefits help reduce uncertainty and resistance to change, particularly in environments where data analytics is not yet widely understood or utilized. Firms that clearly understand the strategic potential of BDA are better positioned to make the necessary investments and organizational adjustments. Therefore, creating awareness about the value of BDA through pilot programs, training, and success stories is essential to fostering adoption, especially in developing economies like Nigeria where data-driven innovation is still emerging.

Top management support is defined as the degree to which senior executives are committed to, and involved in, the implementation of a technological innovation. This includes not only providing the financial and technical resources necessary for BDA projects but also setting a strategic vision, removing internal barriers, and fostering a data-driven culture. According to Chwelos, Benbasat, and Dexter (2001), strong managerial commitment significantly increases the likelihood of successful IT adoption by ensuring alignment between technology initiatives and organizational goals. In the context of BDA adoption, top management plays a critical role in championing analytics as a strategic priority. Lai et al. (2018) emphasized that support from senior leaders is crucial for driving the communication, coordination, and institutional backing required to integrate BDA

into core business operations. Without such support, analytics initiatives often fail to scale or remain isolated within specific departments.

For hospitality firms in Nigeria, where technological innovation may be constrained by limited resources and traditional management practices, the role of top leadership is even more pronounced. Managers who are aware of global trends and willing to invest in training and infrastructure can serve as catalysts for transformation. Their support not only legitimizes BDA efforts but also helps in overcoming resistance from employees who may be unfamiliar with data analytics or skeptical about its utility.

IT infrastructure refers to the technological foundation, comprising hardware, software, networks, and human resources, needed to support the deployment and use of information systems, including BDA. A robust IT infrastructure enables firms to store, process, and analyze large volumes of data efficiently and securely. It also facilitates integration with various data sources such as booking platforms, customer management systems, and social media analytics tools. Firms with modern, scalable, and flexible IT infrastructure are better equipped to adopt and benefit from BDA. According to Iacovou, Benbasat, and Dexter (1995), IT capability significantly influences the adoption of electronic data interchange and other IT innovations. Similarly, Maduku et al. (2016) found that firms with stronger IT resources are more inclined to embrace data-intensive technologies such as cloud computing and analytics.
In hospitality, the quality of IT infrastructure affects the ability to deliver real-time insights into occupancy rates, guest preferences, and service performance. However, many Nigerian hospitality firms still operate with legacy systems or manual processes that hinder data integration and analytics. This creates a technological gap that must be addressed through investment in modern infrastructure, employee training, and vendor partnerships. Lai et al. (2018) acknowledged that although IT infrastructure is foundational, its effect on adoption may be indirect, often mediated by organizational readiness or managerial vision. Nonetheless, without adequate infrastructure, even the most well-intentioned BDA initiatives are unlikely to succeed, particularly in data-intensive environments such as hospitality services.

2.2 Empirical Review

Empirical studies on the adoption of Big Data Analytics (BDA) have expanded significantly over the past decade, with researchers focusing on various sectors including logistics, manufacturing, retail, health care, and increasingly, the service industry. However, relatively few studies have examined BDA adoption specifically in the hospitality sector, particularly within the context of developing countries like Nigeria. Existing empirical evidence has largely drawn on the Technology–Organization–Environment (TOE) framework and the Diffusion of Innovation (DOI) theory to examine factors influencing adoption intentions and behaviors at the firm level.

Perceived benefits have been consistently found to be among the strongest predictors of BDA adoption across industries. In a seminal study by Lai, Sun, and Ren (2018) focusing on logistics and supply chain management, perceived benefits were shown to have a significant positive influence on firms' intention to adopt BDA. The study found that firms were more likely to adopt analytics tools when they believed such tools would improve decision-making, reduce costs, enhance responsiveness, and strengthen supply chain coordination. Similarly, Gunasekaran et al. (2017) demonstrated that firms in high-velocity markets that valued predictive analytics for demand forecasting and inventory control reported greater likelihood of integrating BDA into their operations. In the hospitality context, Kumar, Dixit, and Javalgi (2022) found that hotels that perceived higher value in customer analytics and demand prediction tools were more inclined to adopt BDA applications for revenue management and guest personalization.

Top management support has also emerged as a critical organizational factor influencing BDA adoption. Chwelos et al. (2001) observed that managerial commitment to innovation, expressed through resource allocation and clear strategic direction, was a strong enabler of electronic data interchange adoption. In a related study, Maduku, Mpinganjira, and Duh (2016) found that small and medium enterprises (SMEs) in South Africa were more likely to adopt mobile marketing technologies when leadership showed high involvement and interest in digital innovation. For BDA, Lai et al. (2018) noted that top management support not only increases adoption likelihood but also facilitates internal communication and integration across business functions. Empirical evidence from the hotel sector by Maroufkhani et al. (2020) confirmed that executive leadership played a critical role in aligning BDA with business strategy, encouraging interdepartmental collaboration, and overcoming resistance to change.

Regarding IT infrastructure, the availability and quality of technological resources have shown mixed empirical results in influencing BDA adoption. While some studies confirm a positive relationship, others find the effect to be insignificant or indirect. For example, Hsu, Ray, and Li-Hsieh (2014) found that firms with well-established IT infrastructures were significantly more likely to adopt cloud-based analytics solutions. However, in the study by Lai et al. (2018), IT infrastructure was not found to have a significant direct effect on BDA adoption in logistics

firms, suggesting that firms could overcome technological gaps through outsourcing or vendor partnerships. This nuance is especially relevant for developing countries where technological infrastructure may be weak, yet firms still pursue innovation through third-party support. In the Nigerian context, Adeoye and Adebayo (2020) reported that hospitality firms with better digital systems and trained personnel showed higher levels of readiness for data-driven transformation, despite sector-wide infrastructure limitations.

Across these studies, a recurring theme is the importance of context, both sectoral and geographical, in shaping the impact of these determinants. While perceived benefits tend to have a universally strong influence, the roles of top management support and IT infrastructure may vary depending on institutional maturity, organizational size, and market conditions. In developing economies like Nigeria, where digital literacy and technology budgets may be constrained, managerial commitment and clear perception of benefits can compensate for infrastructural gaps. This highlights the need for more empirical research tailored to sector-specific realities, particularly in the hospitality industry where customer engagement, service personalization, and dynamic pricing strategies increasingly rely on real-time data analytics.

2.3 Theoretical Framework

This study is anchored on the Technology–Organization–Environment (TOE) framework developed by Tornatzky and Fleischer (1990), which explains how organizational adoption of technological innovations is influenced by three key contexts: technological, organizational, and environmental. For this study, only the technological and organizational contexts are emphasized, as the focus is on internal determinants of Big Data Analytics (BDA) adoption. Within the technological context, perceived benefits represent the firm's assessment of BDA's value in enhancing efficiency and decision-making. The organizational context is reflected in top management support and IT infrastructure, which determines the availability of leadership commitment and technological capacity necessary for adoption. The TOE framework is well-suited for studying firm-level technology adoption and has been widely applied in BDA research (Lai et al., 2018; Hsu et al., 2014). It provides a structured basis for analyzing how internal factors influence the decision-making process regarding the adoption of BDA in Nigerian hospitality firms.

3. Methodology

This study adopted a quantitative research methodology to investigate the determinants of Big Data Analytics (BDA) adoption among firms in the hospitality industry in Abuja, Nigeria. A survey research design was employed, using a correlational approach to assess the strength and direction of relationships between independent variables and dependent variables. The correlational design is appropriate for studies that seek to understand associations between variables without manipulating them, especially within real-world organizational contexts. The research is grounded in the positivist research philosophy, which emphasizes objective measurement, hypothesis testing, and the use of structured instruments to gather data. Under this paradigm, reality is considered to be stable and measurable, and knowledge is derived from observable and quantifiable facts. This approach is suitable for the study because it involves hypothesis testing based on established theoretical constructs using statistical tools.

The population for this study comprises 270 firms operating in the hospitality industry in Abuja, including hotels, resorts, service apartments, guest houses, and hospitality management companies. Abuja was selected due to its status as Nigeria's capital city and its growing concentration of formal hospitality establishments that are increasingly adopting digital tools for customer engagement and operational efficiency. These firms represent a relevant population for studying the adoption of BDA, as they generate and manage a significant volume of customer, transaction, and service delivery data. The sampling method employed was purposive sampling, targeting hospitality firms that have an IT department, use computerized booking or customer relationship systems, or have adopted any form of digital analytics tools. This ensured the relevance and suitability of respondents for the study. The sample size consisted of 100 firms in Abuja, with each firm represented by a key informant, typically a manager or IT officer, who is familiar with the firm's digital systems and strategic decision-making processes. This approach aligns with prior studies (e.g., Lai et al., 2018; Maduku et al., 2016) that collect data from IT or managerial staff as organizational representatives in technology adoption research.

The study used primary data, which were obtained directly from the target population through the administration of a structured questionnaire. The questionnaire was designed based on validated scales adapted from previous studies, including Lai, Sun, and Ren (2018), Gunasekaran et al. (2017), and Maduku et al. (2016). It consisted of closed-ended questions measured on a five-point Likert scale ranging from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”). The questionnaire was divided into two main sections: Section A captured demographic and organizational data (e.g., firm size, age, digital readiness), while Section B focused on the constructs of interest—perceived benefits, top management support, IT infrastructure, and BDA adoption.

The data collection process involved both physical distribution and electronic circulation of the questionnaire. For physical distribution, research assistants visited hospitality firms in Abuja to administer and retrieve complete questionnaires. For firms that preferred electronic communication, the questionnaire was distributed via email or Google Forms. This hybrid approach enhanced response rates and allowed respondents flexibility to complete the instrument at their convenience. Ethical considerations, including informed consent and confidentiality assurances, were observed throughout the data collection process. The technique of analysis adopted for this study is Ordinary Least Squares (OLS) regression, which is appropriate for modeling linear relationships between one dependent variable and multiple independent variables. OLS regression enables the estimation of the extent to which changes in perceived benefits, top management support, and IT infrastructure predict changes in the level of BDA adoption. The analysis was conducted using Stata 13. Descriptive statistics were first computed to summarize the characteristics of the sample. Thereafter, Pearson correlation coefficients were calculated to examine the strength of association among variables. Finally, OLS regression analysis was carried out to test the study's hypotheses.

Consistent with previous studies such as Rai et al. (2018) and Wamba et al. (2017), the following regression analysis is used to test the hypotheses.

Table 1
Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
BDA	100	3.45	.6092718	2	5
PRB	100	3.98	.6663636	2	5
TMS	100	3.78	.6602724	2	5
IT	100	3.55	.7961397	1	5

The dependent variable, BDA Adoption, had an average score of about 3.5, suggesting that while some firms are adopting BDA, a majority are still in the early stages. The mean score for Perceived Benefits was approximately 4.0 (on a 5-point Likert scale), indicating that most firms agreed that BDA could enhance efficiency and decision-making. Top Management Support had a mean of about 3.8, suggesting moderate support from leadership toward analytics initiatives. IT Infrastructure had a slightly lower mean of around 3.5, reflecting limitations in digital readiness in some firms.

To evaluate the assumption of normality for regression analysis, the Shapiro-Wilk (SWilk) test was conducted. Table 2 below presents the result of the normality test.

Table 2
Normality Test

Variable	Obs	W	V	z	Prob>z
BDA	100	0.99265	0.607	-1.108	0.86606
PRB	100	0.98427	1.299	0.580	0.28089
TMS	100	0.99018	0.811	-0.464	0.67881
ITI	100	0.98583	1.170	0.348	0.36378

The test yielded a p-value greater than 0.05, indicating that the null hypothesis of normality cannot be rejected. Thus, the distribution of the BDA adoption scores, and the independent variables approximates normality, satisfying one of the key assumptions of Ordinary Least Squares (OLS) regression.

Next, a Pearson correlation analysis was conducted to explore the bivariate relationships among the variables. The result is presented in Table 3.

Table 3
Correlation Analysis

Variables	BDA	PRB	TMS	ITI
BDA	1.0000			
PRB	0.1219	1.0000		
TMS	0.3741	-0.1708	1.0000	
ITI	0.2759	0.0971	-0.0942	1.0000

Perceived Benefits, Top Management Support, and IT Infrastructure all showed positive correlations with BDA Adoption, with coefficients ranging from 0.12 to 0.37. These correlations suggest that as firms perceive greater benefits, receive more executive support, and possess stronger IT infrastructure, their likelihood of adopting BDA increases. In addition, the mild correlations among the independent variables suggest that there is absence of harmful multicollinearity among the independent variables. Gujarati and Porter (2009) observed that correlation values less than 0.80 indicates absence of exact correlations among independent variables.

This study employs OLS regression to test hypotheses. The result is presented in Table 4 below.

Table 4
Regression Analysis

Variables	Coef.	Std. Err.	t	P>t
PRB	.1520815	.0815124	1.87	0.065
TMS	.3975369	.082241	4.83	0.000
ITI	.2298377	.0675227	3.40	0.001
CONS.	.5261026	.5422324	0.97	0.334
R-Squared		0.2643		
Adj. R-squared		0.2413		
F		11.50		
Prob.		0.0000		

The results of the OLS regression analysis revealed that all three independent variables had a statistically significant and positive impact on BDA Adoption. The model explained a substantial proportion of the variance in BDA adoption ($R^2 \approx 0.2413$), indicating a good fit. Specifically:

Perceived Benefits had a positive and insignificant coefficient ($\beta = 0.152$, $p = 0.065$), confirming insignificant positive effect on adoption of big data analytics. Therefore, this study fails to reject the null hypothesis one, which states that perceived benefit has no significant on big data analytics adoption among companies in the hospitality sector in Nigeria. Top Management Support is a significant predictor ($\beta = 0.398$, $p = 0.000$) reinforcing the importance of executive commitment. Thus, this study rejects the null hypothesis two, which states that top management support has no significant on big data analytics adoption among companies in the hospitality sector in Nigeria. IT Infrastructure has a significant positive effect on big data analytics adoption ($\beta = 0.230$, $p = 0.000$). Based on this, the study rejects the null hypothesis three, which states that IT infrastructure has no significant effect on big data analytics adoption among companies in the hospitality sector in Nigeria. These results align with findings from Lai et al. (2018) and Maduku et al. (2016), which highlight the importance of organizational and technological readiness in digital transformation efforts.

To assess multicollinearity among the independent variables, the Variance Inflation Factor (VIF) test was conducted. The test results are presented in Table 4.

Table 4
Multicollinearity Test

Variable	VIF	1/VIF
PRB	1.04	0.964202
TMS	1.04	0.964751
ITI	1.02	0.984373
Mean VIF	1.03	

All VIF values were below 5, indicating that multicollinearity is not a concern in the model. This suggests that the independent variables are sufficiently distinct and contribute uniquely to the prediction of BDA adoption. In addition, the Breusch-Pagan test was used to check for heteroscedasticity in the regression residuals. The test returned a p-value above 0.05, indicating that the null hypothesis of homoscedasticity cannot be rejected. This means that the variance of the residuals is constant across all levels of the independent variables, thus meeting another key assumption of OLS regression.

The major findings of this study indicate that top management support has a significant and positive influence on the adoption of Big Data Analytics (BDA) among hospitality firms in Abuja. This finding aligns with prior studies such as Lai, Sun, and Ren (2018) and Maduku, Mpinganjira, and Duh (2016), who emphasized that strong leadership involvement is critical for successful adoption of digital innovations. These studies found that when executives champion analytics initiatives, through resource allocation, strategic alignment, and vision, firms are more likely to adopt BDA. Similarly, Maroufkhani et al. (2020) found in the hospitality context that top management plays a pivotal role in creating a data-driven culture. The consistent findings reinforce the argument that leadership commitment is a universal enabler of BDA, especially in environments where digital maturity is still evolving.

In contrast to top management support, the study found that perceived benefits, though positively related to BDA adoption, had an insignificant effect statistically. This result diverges from studies like Gunasekaran et al. (2017) and Rai et al. (2006), which identified perceived benefits as one of the strongest predictors of technology adoption. One possible explanation for this variation lies in contextual differences. In developed economies, the translation of perceived benefits into action is often immediate due to better access to resources and fewer implementation barriers. However, in the Nigerian hospitality sector, firms may recognize the potential value of BDA but lack the strategic or operational readiness to act on that perception. This suggests a gap between awareness and implementation, reinforcing the need for leadership action and supportive infrastructure to bridge that divide.

The significant impact of IT infrastructure on BDA adoption in this study is also consistent with earlier research. For instance, Hsu, Ray, and Li-Hsieh (2014) found that firms with modern IT systems and technical competencies were more likely to implement cloud-based analytics tools. Likewise, Maduku et al. (2016) and Aldosari et al. (2023) reported that infrastructure quality positively influenced adoption of mobile marketing in African SMEs. However, unlike Lai et al. (2018), who found the effect of IT infrastructure to be statistically insignificant in logistics firms, this study's finding suggests that in the hospitality sector, where real-time data processing and customer personalization are critical, robust IT infrastructure is indispensable. The contrast between these findings may stem from sectoral differences in data intensity and operational complexity, further emphasizing the need for industry-specific research on technology adoption.

5. Conclusions and Recommendations

This study examined the determinants of Big Data Analytics (BDA) adoption among firms in the hospitality industry in Abuja, Nigeria, with a focus on three key variables: perceived benefits, top management support, and IT infrastructure. Drawing on the Technology–Organization–Environment (TOE) framework and using Ordinary Least Squares (OLS) regression analysis, the study provided empirical evidence on how these organizational and technological factors influence BDA adoption. The results revealed that top management support and IT infrastructure had statistically significant and positive effects on BDA adoption. This implies that the commitment of senior executives and the availability of reliable IT systems are critical enablers of BDA integration within hospitality firms. Firms with strong leadership backing and robust IT capacity are more likely to invest in and utilize data analytics tools to enhance service delivery, decision-making, and operational performance. Conversely, perceived benefits, though positively related to BDA adoption, showed an insignificant effect. This indicates that even when firms recognize the potential advantages of BDA, such recognition alone does not translate into adoption unless it is supported by internal capacity and executive direction. This finding suggests a gap between awareness and action, possibly due to uncertainty, risk aversion, or implementation challenges.

Based on the findings, the following recommendations are proposed to improve the adoption of BDA in the Nigerian hospitality industry:

i. Hospitality firms should prioritize top management involvement in digital transformation initiatives. Senior executives need to actively promote analytics adoption, allocate budgets, and integrate BDA into the overall strategic vision of the organization. Leadership advocacy is essential for overcoming resistance, mobilizing resources, and ensuring sustained implementation.
ii. Firms should invest in upgrading their technological infrastructure to support

BDA systems. This includes not only acquiring modern hardware and software but also training IT personnel and operational staff on analytics tools and techniques. Partnering with vendors or third-party analytics providers can also help overcome resource limitations.

iii. While many firms may recognize the potential benefits of BDA, this perception must be translated into concrete action. Industry associations, policy makers, and consultants can help by organizing workshops, case studies, and pilot programs that demonstrate practical use cases and measurable outcomes of BDA in hospitality operations.

This study is not without limitations. First, it focused exclusively on hospitality firms in Abuja, which may limit the generalizability of the findings to other regions or sectors within Nigeria. Second, the study relied on cross-sectional data, capturing firm perceptions and conditions at a single point in time, which may not reflect changes in adoption behavior over time. Third, the analysis considered only internal organizational factors, perceived benefits, top management support, and IT infrastructure, while excluding potential environmental or external influences such as regulatory frameworks, competitive pressure, or customer expectations. Future studies could adopt a longitudinal design to track BDA adoption trends over time and incorporate a broader range of variables under the full TOE framework. Additionally, qualitative approaches such as case studies or interviews could provide deeper insights into organizational dynamics, challenges, and success factors influencing BDA adoption in the Nigerian hospitality sector and beyond.

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