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Cloud Infrastructure and Enterprise IT Environment

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Abstract: Cloud infrastructure has emerged as a game-changer for the enterprise IT environment in Nigeria. As the country's businesses continue to grow and adapt to the digital era, cloud computing offers a scalable, flexible, and cost-effective solution for managing data, applications, and services. The adoption of cloud technology has the potential to revolutionize the way Nigerian enterprises operate, streamlining processes, enhancing collaboration, and improving overall efficiency. The study, however, investigated the effect of cloud infrastructure on the enterprise IT environment in Nigeria. The study used cloud infrastructure as an independent variable, proxied using software as a service (SAAS), platform as a service (PAAS), and infrastructure as a service (IAAS). The dependent variable is enterprise IT environment. The study adopted a survey research design using a simple random sampling technique to distribute about 121 copies of questionnaires among various IT departments in Nigeria. A validity and reliability test were carried out on 10% copies of the questionnaire and the result was reliable at 0.7 and valid. The study's main objective was analyzed using descriptive and inferential methods of statistics. The result found that cloud infrastructure has a significant impact on enterprise IT environment. The study, therefore, suggested that adopting cloud infrastructure offers numerous advantages, enabling companies to optimize their IT resources, access cutting edge, and swiftly adapt to changing market demands.

Keywords: Cloud Infrastructure, Digitalization, Data Science, Enterprise IT environment, Technology, Software, and Services

I. Introduction

Modern businesses rely on technology to perform day-to-day operations and maximize productivity (Chen, & Metawa, 2020). Effective use of tech resources improves workplace efficiency, reduces operational costs, and improves communication. However, the success of technology applications in a business is heavily dependent on the organization's overall IT environment (Tju, Putra, & Handayani, 2020). A business owner or manager must constantly evaluate the health of the IT environment to identify any problem areas and make relevant changes.

An enterprise IT environment is a system that manages digital processes, which can include software and underlying networking and computing components (Chen, & Metawa, 2020). There are three main types of enterprise IT environments: on-premises, cloud, and hybrid (Tju, Putra, & Handayani, 2020). Networking environments are expanding to accommodate remote and on-site users, while security measures are modernizing with automation and AI (Valdebenito, & Quelopana. 2019). Development environments enable software creation and modification, while testing environments ensure software functionality and quality. Production environments allow end users to interact with the software in real-time, with active monitoring and user feedback collection. Defining an ideal enterprise IT environment involves considering business goals and aligning systems and infrastructure accordingly (Khayer, Jahan, Hossain, & Hossain, 2021).

Automation can streamline workflows and improve productivity while assigning leaders and maintaining transparency are essential for effective management and control. Full visibility helps avoid waste and maintain a lean IT environment. Several enterprises are now adopting the new cloud computing technology for its cost-effectiveness, efficiency, and productivity (Tju et al., 2020). The cost savings are achieved as the facilities are now part of a "rent model" rather than being "centrally hosted" (Tju et al., 2020). Cloud computing has multiple distinct features such as multi-tenancy, pooling of collective resources, greater diversity, competitive resource provision, and facility-based charging (Tju et al., 2020). In an environment with data self-sovereignty, such as an enterprise IoT-cloud environment, data are directly managed by the cloud once uploaded from user-controlled IoT devices (Tju et al., 2020).

Cloud computing offers computing resources as services to end users and supports various IT business processes (Chen &Metawa, 2020). The computing resources include physical infrastructure as a service, such as compute, network, and storage (Chen &Metawa, 2020). Cloud computing services are offered in different models like Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) (Chen &Metawa, 2020). Security enforcement is required at the infrastructure level (IaaS), platform level (PaaS), and application level (SaaS) of cloud computing (Chen &Metawa, 2020).

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A community cloud is developed when multiple organizations require similar infrastructure and wish to exchange the same, providing cost-effectiveness, privacy, policy compliance, and security (Valdebenito & Quelopana, 2019). Cloud deployment models are selected by customers based on their specific business needs (Valdebenito & Quelopana, 2019). If the customer is more concerned about data security, they may opt for a private cloud model in a home location, while those more concerned about cost may choose a public cloud model for their organization (Valdebenito & Quelopana, 2019).

Cloud infrastructure enables remote storage and usage of data, combining network technology with offline storage (Siha et al., 2022). Data owners upload their data to cloud storage, and when another user requests the data, it can be provided through a data access path and authorized by the cloud storage (Siha et al., 2022). Encryption is necessary to protect data confidentiality, and proxy re-encryption allows secure sharing of data between senders and receivers (Siha et al., 2022). The study, therefore, investigated the effect of cloud infrastructure on enterprise IT environment using Nigeria as a case study. The remaining part of the paper explains the review of past literature, material, and the method used, results and discussion, conclusion, and recommendation.

II. Literature Review

2.1 Conceptual Framework

Enterprise IT Environment

An enterprise IT environment is the infrastructure, systems, and resources that support the information technology needs of a business or organization. It encompasses various components, such as hardware, software, networks, servers, databases, and user devices. It may consist of on-premises infrastructure, cloud-based services, or a combination of both, depending on the organization's requirements and strategy (Chen, & Metawa, 2020). It typically includes elements such as networking, servers, storage, applications and software, security, user devices, and IT support. The enterprise IT environment is essential for enabling efficient operations, improving productivity, facilitating collaboration, and ensuring the security and integrity of data and systems.

Cloud Infrastructure

Cloud infrastructure refers to the components and technologies required for cloud computing, including hardware, abstracted resources, storage, and networking. It involves using virtualization to separate resources from physical hardware and pool them into clouds, which are then managed and allocated through automation software and management tools. Cloud infrastructure includes hardware, virtualization, storage, and network components that work together to support business operations. Hardware, virtualization, storage, and networking are key components of cloud infrastructure, allowing for efficient and flexible cloud computing services (Singh,2021).

- Software as a Service (SaaS) is a cloud computing model where users access software applications from the cloud without the need to manage the infrastructure or platform. Advantages of SaaS include no additional infrastructure or platform requirements, ready-to-use applications upon subscription, simplified application development, automatic software updates, mobility for accessing applications from any internet-enabled device, collaboration across locations, and no initial setup costs (Valdebenito, & Quelopana, 2019).
- Platform as a Service (PaaS) is a cloud computing service model that offers developers a platform to build and utilize applications and services over a communication network. Popular providers include AWS Elastic Beanstalk, Cloud Foundry, and Heroku. PaaS services are regularly updated by the providers, offering upgraded features and additional functionalities. The advantages of PaaS include enabling developers to focus on application development, simplicity in creating applications, user control over installed applications, flexibility for changes or modifications, collaboration across locations, and security concerns Jang, Kim, & Kim, 2020).
- IaaS is a fundamental service model in cloud computing that allocates computing resources to users for running their applications. Network as a Service (NaaS) is a category of cloud infrastructure services that offers network connectivity as a service. Advantages of IaaS include on-demand availability of resources, scalability, no investment in hardware, a pay-per-use pricing model, accessibility from any location with an internet connection, and security of data being saved (Siha, Das, & Ghosh, 2022).

2.2 Theoretical Review

The diffusion of Innovation (DOI) theory, proposed by Everett Rogers in 1962, is the main theory used for this research. It explains how new ideas, products, or technologies spread and are adopted by individuals and groups within a social system. It identifies five main elements that shape the diffusion process: innovation, communication channels, time, social system, adopters, perceived relative advantage, compatibility, complexity, trialability, and observability of the innovation (Fagan, (2001). Adopters are

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individuals or groups who choose to accept and use the innovation, and their characteristics, such as their perception of the innovation's benefits, their risk tolerance, and their social influence, influence their adoption decisions.

The DOI theory also identifies several factors that influence the rate and extent of adoption, such as perceived relative advantage, compatibility, complexity, trialability, and observability of the innovation. The DOI theory provides insights into how new ideas, products, or technologies spread and are adopted within a social system, and helps researchers and practitioners understand the adoption process, identify barriers and facilitators, and develop strategies to promote successful diffusion and adoption of innovations (Amini, & Jahanbakhsh Javid, 2023). DOI proposed by Rogers, is one of the most commonly used theories to study the adoption of innovations; however, this theory has its own drawbacks; for instance, it does not consider the environmental aspects of the context (Amini, Sadat Safavi, Mirzaeyan Bahnamiri, Mirzaei Omran, & Amini, 2014). complexity has a negative effect on diffusion. This means that a more complex innovation has less chance to be successfully diffused in society. Trial ability is defined as “the degree to which an innovation may experiment on a limited basis”. Last but not least, is observe ability, which is “the degree to which the results of an innovation are visible to others”. According to Tornatzky and Fleischer (1990), among all these five characteristics, relative advantage, compatibility, and complexity are factors that most significantly influence the adoption rate of different innovations.

2.3 Empirical Review

This empirical review aims to examine multiple studies that have investigated the relationship between cloud infrastructure and the enterprise IT environment. While recent research has paid little or no attention to this specific relationship, the intersection of cloud infrastructure and enterprise has garnered significant attention when considered in conjunction with other variables. Singh (2021) conducted a study on securing cloud infrastructure using an enterprise honeypot. The methodology involved integrating a Honeyed honeypot with Snort to identify hidden security flaws and prevent internal intrusions or attacks. Experimental findings were obtained by implementing the enterprise honeypot in Cloud Infrastructure (ICI) environment, demonstrating its effectiveness in addressing security threats.

Some researchers also provide insights that can inform strategies for promoting the successful implementation and utilization of cloud services within enterprises. Khayer, Jahan, Hossain, and Hossain (2021) collected data from 372 small and medium enterprises (SMEs) to investigate the determinants of cloud computing adoption. The research model was tested using statistical analysis, specifically regression analysis, to examine the impact of factors such as performance expectancy, effort expectancy, absorptive capacity, data security and privacy, and perceived trust on cloud adoption. The study also analyzed the direct and indirect effects of cloud adoption on firm performance through organizational agility. Similarly, Marinho, Prakash, Garg, Savaglio, and Bawa, (2021) conducted an online survey questionnaire, which received 109 responses from decision-makers and professionals in the US consumer goods industry. The survey explored the opportunities and challenges of C-ERP adoption for Industry 4.0. The study analyzed the collected data to identify factors that influenced the decision to adopt C-ERP, including the predictor's complexity, regulatory compliance, and technology readiness.

Furthermore, Siha, Das, and Ghosh, (2022) conducted an analysis of the growth of internet-based WAN solutions compared to MPLS services. The study involved examining data and trends over the past five years to evaluate the increasing adoption of internet-based WAN solutions and their impact on accessing cloud applications. The analysis focused on the benefits of the local breakout to the public Internet through secured cloud proxies. In addition, Valdebenito and Quelopana (2019) adopted the Technological, Organizational, and Environmental (TOE) framework for their study. The methodology involved collecting data through surveys or interviews from individuals in organizations. The collected data was then analyzed to identify factors influencing cloud adoption, including perceived value, security concerns, customization, organizational readiness, top management support, competitive pressure, and vendor qualities.

Further study for advancement of research in the field of cloud computing by providing practical approaches to enhance semantic interoperability in multi-cloud environments and offering assessment indicators to evaluate the effectiveness and value of cloud IaaS for enterprises. Benhssayen and Ettalbi (2021) introduced a novel solution aimed at addressing semantic interoperability challenges within a multi-cloud environment. The study focused on the development of a framework specifically designed to enable the seamless exchange of information and resources between different Infrastructure as a Service (IAAS) providers. By facilitating semantic interoperability, the proposed framework aimed to assist cloud consumers in efficiently retrieving cloud resources that align with their specific requirements. The researchers followed a comprehensive methodology, involving the design and implementation of the framework, as well as evaluating its effectiveness in overcoming limitations inherent in the IAAS service model. Furthermore, Tsai (2021) undertook the construction of assessment indicators tailored for enterprises utilizing cloud IaaS. The methodology employed by the researcher centered on leveraging perceived value as the foundation for the research structure. Through an iterative process that integrated resource dependence theory and transaction cost theory, a set of assessment indicators

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was developed. To ensure the validity and reliability of the indicators, experts in the field were engaged using the Delphi technique, where their input was reviewed and validated.

Efficient change control and configuration management are imperative for addressing the emerging security threats in cloud infrastructure which lead to a study done by Torkura, Sukmana, Cheng, and Meinel, (2021) Continuous auditing and threat detection in multi-cloud infrastructure. They propose cloud storage buckets (CSBAuditor) and evaluated them using various strategies including security chaos engineering (fault injection) strategies on Amazon Web Services and Google Cloud Platform and concludes that CSBAuditor effectively detects misconfigurations in real-time with a detection rate of over 98%. Also, the performance overhead is within acceptable limits. Similarly, Atieh, (2021) explores how an organization assure the optimum level of
infrastructure security in three domains: network infrastructure security, physical infrastructure security, and cloud infrastructure security. The findings suggest that there are a few recommendations for assuring the right security level for the network infrastructure, including conducting a network security assessment, keeping user access privileges to a bare minimum for work, updating programs, investigating cybersecurity tools, and Increasing cyber-awareness. Physical infrastructure security is also crucial.

Few researchers offer practical insights and recommendations for enhancing software traceability, facilitating SaaS adoption in MSMEs, and effectively managing enterprise SaaS workloads across multi-cloud platforms. Jang et al. (2020) proposed a software traceability environment based on PaaS cloud service. The methodology included developing a cloud-based software visualization environment and presenting a case study on building the visualization environment. The study demonstrated the practicality and benefits of the proposed method in improving software traceability for SMEs. Tju et al. (2020) collected data from 136 owners or directors of micro, small, and medium enterprises (MSMEs) in Indonesia. The research utilized the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique to examine the influence of environmental factors on SaaS adoption in MSMEs. The analysis considered different organizational scales of MSME. Achar, (2021), enterprise SaaS Workloads on New-Generation Infrastructure-as-Code (IaC) on Multi-Cloud Platforms. presents a vision of uniformly managing the infrastructure provisioning of enterprise SaaS applications that utilize multiple cloud providers. Hence, we introduce an initial design for the IaC-based Multi-Cloud Deployment pattern and discuss how it addresses the relative challenges.

The existing research provides valuable insights into the potential benefits and challenges of cloud infrastructure implementation within organizational IT environments. It highlights the need for further investigation specifically targeting the implications, opportunities, and considerations of integrating cloud infrastructure into enterprise IT ecosystems. Through these studies, it becomes evident that cloud infrastructure significantly impacts enterprises and their IT environments. While extensive research has been conducted on various aspects of cloud infrastructure, such as adoption, models, and cloud environments, as well as their relationship with the business environment, only a limited number of studies have directly focused on the connection between cloud infrastructure and the enterprise IT environment.

III. Material and Methods

In this research, the effect of cloud infrastructure on enterprise IT environment using Nigeria as a case study. The study employed a survey research design using a simple random sampling technique to distribute a sample of 121 copies of questionnaires distributed among various IT companies in Nigeria. A structured and validated questions were formulated and used for the data analysis.

Prior to the analysis, a validated and reliability test was carried out using 10% copies of the questionnaire and the results range from 0.81 to 0.89, indicating good and reliable questions were formulated and used in the study/ The Study employed descriptive statistics (frequency and percentage distribution), correlation analysis, and multiple linear regression analysis using the Statistical Packages for Social Sciences (SPSS). The decision of the multiple linear regression was taken at a 5% significance level.

The research model for the cloud infrastructure and enterprise IT environment is thus:

$Y = f(X)$

Where

Y = Dependent Variable = Enterprise IT environment (EITE)

X = Independent Variable = Cloud Infrastructure (CIT)

$X = (x_1, x_2, x_3)$

x_1 = Software as a service (SAAS)

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x_2 = Platform as a service (PAAS)

x_3 = Infrastructure as a service (IAAS)

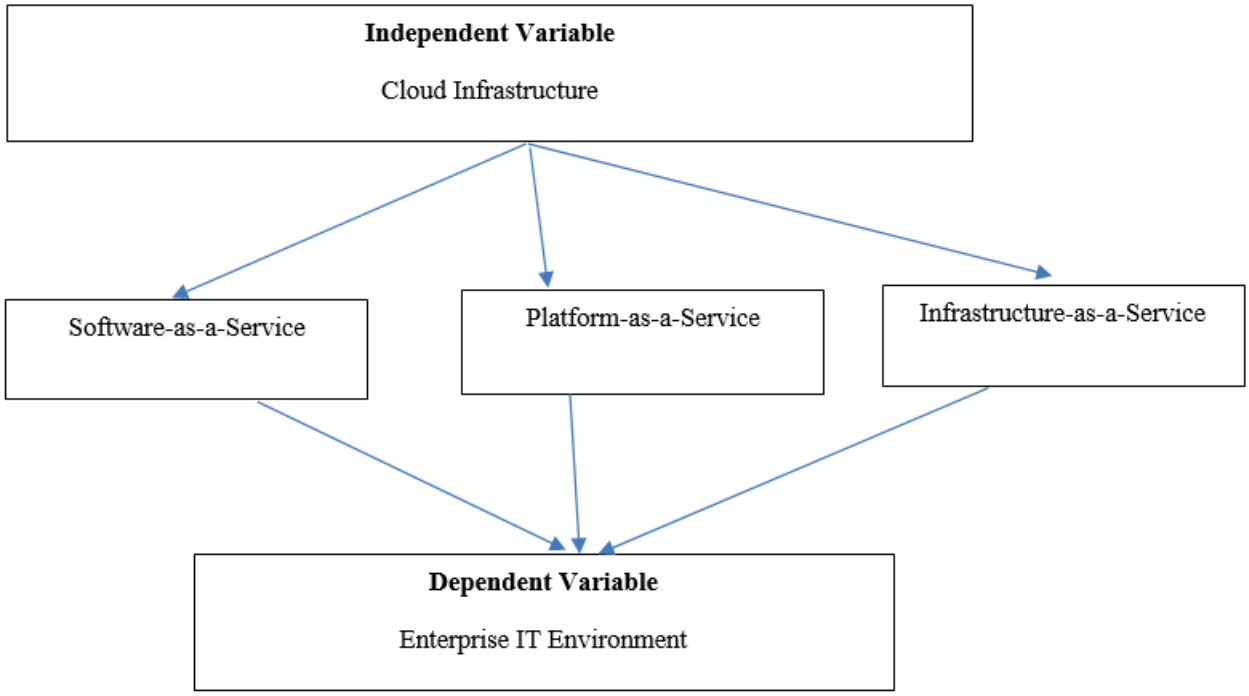
The model is formulated as thus:

EITE = $\beta_{\circ} + \beta_1 SAAS_1 + \beta_2 PAAS_2 + \beta_3 IAAS_3 + e$;

where $\beta_{\circ}$ is the constant; β_1 is the estimated coefficient of SAAS; β_2 is the estimated coefficient of PAAS, β_3 is the estimated coefficient of IAAS, and e is the stochastic error term.

Based on the model, formulated above, the hypothesis and the research conceptual model are formatted as:

$H_0$1(Null hypothesis): Cloud infrastructure has no significant impact on enterprise IT environment in Nigeria



Source: Researcher's Conceptual Model, 2023.

IV. Results and Discussion

In this section, the study used descriptive statistics to analysis the socio-demographic characteristics of the respondents, correlation analysis to depend the independent of the proxies of cloud infrastructure, and multiple linear regression analysis to explain the impact of cloud infrastructure on enterprise IT environment in Nigeria. The study distributed 121 copies of questionnaires and 91.7% of the copies of the questionnaires were retrieved in Table 1.

Table 1: Response Rate

Questionnaire	Frequency Distribution	Percentage Distribution
Return	111	91.7
Not return	10	8.3
Total	**121**	**100.0**

Source: Researcher's Field Survey, 2023

Table 2 shows that 65.8% of the total respondents are male, indicating that most of the participants who responded to the study and are familiar with the IT environment are male. The study also showed that the participants who used more cloud infrastructure and

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enterprise IT environment are the participants who have HND/BSc/BTech and they have between 5 – 10 years of working experience.

Table 2: Frequency and Percentage Distribution of Socio-demographic Characteristics

Socio-demographic Characteristics	**Frequency Distribution**	**Percentage Distribution**
Gender		
Male	73	65.8
Female	38	34.2
Total	111	100.0
Educational Background		
NCE/OND	12	10.8
HND/BSc/BTech	82	73.9
Master & PhD	17	15.3
Total	111	100.0
Years of Experience		
< 5 years	41	36.9
5 – 10 years	65	58.6
➢ 10 years	5	4.5
Total	111	100.0

Source: Researcher's Field Survey, 2023

In the result of Table 3, bivariate analysis which uses Pearson product-moment correlation and multicollinearity analysis used both variance inflation factor (VIF) and tolerance level (1/VIF) are shown accordingly. The Pearson product-moment correlation coefficient established the independence level of cloud infrastructure, proxied by SAAS, PAAS, and IAAS. The result of the proxies showed that a positive association occur between the variables. The study showed that the proxies of the cloud infrastructure are independent of each other and they are weak correlated. This means a need to proceed with the analysis as the proxies are independent of each other. Also, multicollinearity analysis is used to confirm the result of the bivariate analysis which is less than 0.75. The study proceeded by showing no problem of multicollinearity test as the result of the variance inflation factor (VIF) < 10 and the tolerance level (1/VIF) < 1, indicated a need to proceed with the regression analysis.

Table 3: Bivariate and Multicollinearity Analysis

Cloud Infrastructure	SAAS	PAAS	IAAS	VIF	1/VIF
SAAS	1.000			2.186	0.457
PAAS	0.314	1.000		3.191	0.313
IAAS	0.417	0.439	1.000	2.101	0.476

Source: Researcher's Field Survey, 2023

The hypothesis developed stated that cloud infrastructure has no significant impact on enterprise IT environment using Nigeria as a case study. The hypothesis is formulated in Section 3.0 above. The estimated coefficient of the parameters shown in Table 4 showed that all the proxies of cloud infrastructure (SAAS, PAAS, IAAS) hasa positive effect on the dependent variable (enterprise IT environment). The study showed that a unit increase in SAAS will lead to a 0.171 positive impact on enterprise IT environment and the standard error is 0.187. PAAS showed that an increase impact on enterprise IT environment, indicating that a unit increase in PAAS will lead to a 0.002 positive impact on enterprise IT environment. Also, IAAS showed an impact on enterprise IT

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environment. It indicated that a unit increase in IAAS will lead to a 0.167 positive impact and increase in enterprise IT environment. This reflects that all the proxies of cloud infrastructure have a positive impact as well as increases the enterprise IT environment in Nigeria.

The probability statistics reflect the individual significance of each proxy of cloud infrastructure in the models. Each of the proxies was tested at a 0.05 (5%) level of significance. The proxies of the cloud infrastructure were individual significance at 5%. This means that SAAS has a significant positive impact (P-value = 0.008); PAAS has a significant impact (P-value = 0.023), and IAAS has a significant impact (P-value = 0.016) on enterprise IT environment in Nigeria.

Meanwhile, the adjusted r square is used to test the goodness of fit of the regression model which explained how the change in the enterprise IT environment is caused by the collective interactions of SAAS, PAAS, and IAAS (cloud infrastructure). The result shows that 71.4% of the proxies of cloud infrastructure are attributed to enterprise IT environment while the remaining 28.6% is lost to a stochastic error term or random error.

Table 4: Cloud Infrastructure and Enterprise IT Environment

Variable	**Coeff.**	**Std. Error**	**P-value**
Constant	2.176	0.187	0.000
SAAS	0.171	0.145	0.008
PAAS	0.002	0.076	0.023
IAAS	0.167	0.204	0.016
Adj R^2	0.714	DF = 3, 107	
F stat	4.871	Prob (F statistics)	0.0001

Source: Researcher's Field Survey, 2023

EITE = $2.176 + 0.171\,SAAS_1 + 0.002PAAS_2 + 0.167IAAS_3$

Decision: At a significance level of 0.05 and the degree of freedom 3, 107, the F statistics is 4.871 while the P-value of the F-statistics is 0.0001 which is less than the level of significance adopted in the study. The result of the analysis indicated that the null hypothesis stating that cloud infrastructure has no significant impact on enterprise IT environment is rejected at p-value = 0.0001 < 0.05 (5% significance level). Thus, the study found that cloud infrastructure, proxied by SAAS, PAAS, and IAAS has a significant impact on enterprise IT environment using Nigeria as a case study.

V. Discussion of Findings

The paper revealed findings on cloud infrastructure and enterprise IT environment in Nigeria. Cloud Infrastructure was determined using software as a service (SAAS), platform as a service (PAAS), and infrastructure as a service (IAAS). The cloud infrastructure was used as a dependent variable while enterprise IT environment is the independent variable. The result of the analysis showed that cloud infrastructure significantly impacted on enterprise IT environment in Nigeria. The three proxies of the cloud infrastructure positively contributed to the impact of enterprise IT environment.

Past studies showed that cloud infrastructure empowers businesses with a competitive edge, driving innovation, efficiency, and agility. Embracing cloud technology in the enterprise IT environment is not just a trend but a strategic imperative for organizations seeking to thrive in an increasingly digital and interconnected world. The findings showed that cloud infrastructure has a significant impact on enterprise IT environment as this result is inline with the study of Singh, (2021) discussed about the implementation of the enterprise honeypot in the cloud infrastructure environment, demonstrating its effectiveness in addressing security threats. The research of Khayer et al (2021) was in corroboration with the findings as well as the findings of Marinho et al (2021) which identified the factors influencing the decision to adopt cloud enterprise and technology readiness. Other researchers include Jang et al (2020), Achar (2021), Torkura et al (2021).

VI. Conclusion and Recommendation

Cloud infrastructure has emerged as a game-changer for the enterprise IT environment in Nigeria. As the country's businesses continue to grow and adapt to the digital era, cloud computing offers a scalable, flexible, and cost-effective solution for managing data, applications, and services. The adoption of cloud technology has the potential to revolutionize the way Nigerian enterprises

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operate, streamlining processes, enhancing collaboration, and improving overall efficiency. However, while the benefits are evident, there are also challenges to be addressed, such as data security, regulatory compliance, and reliable internet connectivity. With strategic planning, investment, and collaboration between stakeholders, the integration of cloud infrastructure can pave the way for a more resilient, competitive, and innovative business landscape in Nigeria, ensuring sustainable growth and prosperity in the years to come. The study concluded that cloud infrastructure has a significant impact on enterprise IT environment in Nigeria. The study, therefore, recommended that adopting cloud infrastructure offers numerous advantages, such as increased flexibility, scalability, and cost-efficiency. It enables companies to optimize their IT resources, access cutting-edge technologies, and swiftly adapt to changing market demands. Moreover, cloud-based solutions foster seamless collaboration and data sharing, leading to enhanced productivity and innovation within the business ecosystem.

VII. Contribution to Knowledge

The paper has made valuable contributions by shedding light on the intersection of cloud computing and the enterprise IT environment, providing insights crucial for informed business decision-making. Additionally, it has enriched the theoretical body of knowledge by elucidating diverse cloud computing approaches within the context of the enterprise IT environment. Thus, the research explores emerging technology, propose promising avenues for further research, and anticipates potential disruptions poised to reshape the landscape of the cloud industry.

VIII. Limitations and Suggestions for further studies

The paper used conventional methods of evaluating cloud computing such as SAAS, PAAS, and IAAS, with a specific emphasis on their applicability within the IT enterprise context. However, it's worth noting that the study had limitations, notably a relatively small sample size. To enhance the scope of the investigation, expanding the case study to a broader sample size would be appropriate for further study. Based on the limitations, the research suggested alternative indicators or proxies for cloud computing and there is an ample room for further inquiry and investigation in this area. Further researchers can also consider the financial aspect of the enterprise IT environment.

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