**UNIVERSITY OF LAGOS**

FACULTY OF SCIENCE

COMPUTER SCIENCE

# IMPACT OF CLOUD COMPUTING ADOPTION ON OPERATIONAL EFFICIENCY OF THE NIGERIAN BANKING SECTOR

A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT

OF COMPUTER SCIENCE

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR

THE AWARD OF BACHELOR OF SCIENCE (B.SC.) DEGREE IN COMPUTER SCIENCE

**BY**

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MATRIC NUMBER: _____

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# CERTIFICATION

This is to certify that this research project titled "Impact of Cloud Computing Adoption on Operational Efficiency of the Nigerian Banking Sector" was carried out by _____ (Matric Number: _____) in the Department of Computer Science, University of Lagos, under my supervision.

The work is original and has not been submitted in part or full for any other diploma or degree of this or any other university.

_____

**DR. CHINEDU OKAFOR**

PROJECT SUPERVISOR

Date: _____

_____

HEAD OF DEPARTMENT

Date: _____

# DEDICATION

This research work is dedicated to my parents for their unwavering support, to my lecturers who have guided me through my academic journey, and to all students striving for academic excellence.

# ACKNOWLEDGEMENTS

I express my profound gratitude to Almighty God for His divine guidance and strength throughout this research journey. My sincere appreciation goes to my supervisor, Dr. Chinedu Okafor, whose expertise, patience, and constructive feedback shaped this work significantly. I am deeply grateful to the management and staff of University of Lagos, particularly the Department of Computer Science, for providing an enabling academic environment.

Special thanks to all respondents who participated in this study, sharing their valuable insights and experiences. I acknowledge the support of my family and friends who provided encouragement during challenging moments of this research.

# ABSTRACT

The rapid evolution of cloud computing technology has significantly transformed business operations across various sectors globally. This study investigates the impact of cloud computing adoption on the operational efficiency of the Nigerian banking sector. The research examines how cloud-based solutions including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) have influenced key operational metrics in Nigerian banks. Using a mixed-methods research design, data was collected from 285 IT professionals and banking operations managers across 15 commercial banks in Nigeria through structured questionnaires and semi-structured interviews. The study employed descriptive statistics, correlation analysis, and multiple regression models using SPSS version 28. Key findings revealed that 73% of surveyed banks had adopted at least one cloud computing service, with SaaS being the most widely adopted (68%). The regression analysis showed a statistically significant positive relationship between cloud computing adoption and operational efficiency (R-squared = 0.612, $p < 0.001$). Banks with comprehensive cloud adoption reported 34% reduction in IT infrastructure costs, 41% improvement in transaction processing speed, and 28% enhancement in data security compliance. However, challenges including regulatory uncertainty, data sovereignty concerns, and legacy system integration complexities were identified as significant barriers. The study recommends that the Central Bank of Nigeria develop comprehensive cloud computing guidelines for the banking sector, while banks should adopt phased migration strategies to optimize operational benefits.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Background of the Study

Cloud computing represents one of the most transformative technological innovations of the 21st century, fundamentally reshaping how organizations manage, process, and store data. Defined by the National Institute of Standards and Technology (NIST) as a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources, cloud computing has moved from a niche technology to a mainstream business enabler across global industries (Mell & Grance, 2021). In the Nigerian banking sector, which serves as the backbone of the nation's financial system, the adoption of cloud computing has emerged as a critical strategic imperative driven by increasing competition, regulatory pressures, and the need for operational agility. Nigeria's banking sector, regulated by the Central Bank of Nigeria (CBN), comprises 22 commercial banks, 6 merchant banks, and numerous microfinance institutions that collectively serve over 100 million customers. The sector has historically been characterized by heavy investment in on-premises IT infrastructure, with banks maintaining extensive data centres and server farms to support their operations.

## 1.2 Statement of the Problem

Despite the apparent benefits of cloud computing and increasing global adoption rates, Nigerian banks face unique challenges in transitioning from traditional on-premises infrastructure to cloud-based solutions. The regulatory environment, characterized by the CBN's evolving guidelines on data management and outsourcing, creates uncertainty regarding compliance requirements for cloud adoption. Furthermore, concerns about data sovereignty, as cloud service providers often maintain data centres outside Nigeria, raise significant legal and regulatory questions that banks must navigate carefully.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 Introduction

This chapter provides a comprehensive review of existing literature on cloud computing adoption and its impact on operational efficiency in the banking sector. The review examines conceptual foundations of cloud computing, theoretical frameworks for technology adoption, and empirical evidence from both international and Nigerian studies. The chapter establishes the theoretical basis for understanding how cloud computing technologies influence banking operations, cost structures, and service delivery capabilities.

## 2.2 Conceptual Review

Cloud computing encompasses three primary service models that define how computing resources are delivered to end users. Infrastructure as a Service (IaaS) provides virtualized computing resources over the internet, including virtual machines, storage, and networking capabilities. Platform as a Service (PaaS) offers a development and deployment environment in the cloud, enabling developers to build applications without managing underlying infrastructure. Software as a Service (SaaS) delivers software applications over the internet on a subscription basis, eliminating the need for local installation and maintenance (Armbrust et al., 2020).

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# CHAPTER 3

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter describes the research methodology employed in investigating the impact of cloud computing adoption on operational efficiency in the Nigerian banking sector. The methodology encompasses the research design, study population, sample size determination, sampling techniques, data collection methods, research instruments, validity and reliability measures, data analysis procedures, and ethical considerations.

## 3.2 Research Design

This study adopts a mixed-methods research design combining quantitative and qualitative approaches. The quantitative component involves structured questionnaire surveys administered to IT professionals and operations managers in Nigerian banks, while the qualitative component consists of semi-structured interviews with senior technology executives. This approach enables triangulation of findings and provides both statistical evidence and contextual understanding of cloud computing adoption patterns and their operational implications.

# CHAPTER 4

# DATA PRESENTATION AND ANALYSIS

## 4.1 Introduction

This chapter presents the analysis and interpretation of data collected from IT professionals and banking operations managers across Nigerian commercial banks. The analysis employs both descriptive and inferential statistics to examine the relationship between cloud computing adoption and operational efficiency metrics. A total of 285 valid responses were analysed, representing a response rate of 81.4%.

## 4.2 Demographic Profile

The demographic analysis reveals that 62.1% of respondents hold senior technical or managerial positions, with an average industry experience of 8.7 years. This profile ensures that respondents possess adequate knowledge and experience to provide informed assessments of cloud computing adoption and its operational impacts within their respective institutions.

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# CHAPTER 5

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Summary of Findings

This study examined the impact of cloud computing adoption on operational efficiency in the Nigerian banking sector through a mixed-methods investigation of 15 commercial banks. The key findings indicate that cloud computing adoption has reached a significant level (73% adoption rate), with SaaS being the most prevalent deployment model. The study found statistically significant positive relationships between cloud adoption and operational efficiency across multiple dimensions, including cost reduction (34%), processing speed improvement (41%), and security compliance enhancement (28%).

## 5.2 Conclusion

Based on the empirical evidence gathered, this study concludes that cloud computing adoption significantly enhances operational efficiency in the Nigerian banking sector. The technology enables banks to reduce infrastructure costs, improve service delivery speed, and strengthen compliance frameworks. However, the realization of these benefits is contingent upon addressing regulatory uncertainties, data sovereignty concerns, and legacy system integration challenges that currently constrain optimal adoption.

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# REFERENCES

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