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TECHNOLOGICAL ADVANCEMENTS IN ACCOUNTING: HOW COMPUTERIZED SYSTEMS ARE CHANGING OIL AND GAS BUSINESSES IN PORT HARCOURT

Ngozi Chiamaka Eze and Uchechukwu Festus Obi

Department Of Banking and Finance,
Chukwuemeka Odumegwu Ojukwu University,
Igbariam Campus. P.M.B 6059 Awka, Anambra
State, Nigeria.

Abstract: The rapid advancement of Information and Computer Technologies (ICTs) has become indispensable in contemporary societies, permeating all aspects of human activities. Information technology, which includes hardware, software, and IT controls, has revolutionized organizational operations, transforming the way tasks are performed and decision-making processes are supported. CAS refers to an accounting information system that processes financial transactions according to Generally Accepted Accounting Principles (GAAP) with the assistance of computers or automated devices. However, despite the widespread adoption of CAS, there remains a need to assess its impact on organizational performance, particularly in specific sectors such as the oil and gas industry. This study aims to examine the effect of computerized accounting systems on the organizational performance of oil and gas firms in Port Harcourt, Nigeria. Previous research in Nigeria has primarily focused on AIS in general or specific industries, such as deposit money banks, manufacturing companies, microfinance banks, and SMEs. Therefore, the study seeks to fill the gap in literature by investigating the impact of CAS on oil and gas firms' performance, specifically in terms of accountability, productivity, and cost control. The findings of this study will contribute to a better understanding of the relationship between CAS and organizational performance, providing insights for practitioners, policymakers, and researchers in the oil and gas industry. Ultimately, this research endeavors to facilitate informed decision-making regarding the adoption and optimization of computerized accounting systems in the oil and gas sector, thereby enhancing overall organizational performance.

Keywords: Information and Computer Technologies, ICT, Computerised Accounting Systems, CAS, organizational performance, oil and gas industry, accountability, productivity, cost control.

Original Article

INTRODUCTION

The rapid advancement in Information and Computer Technologies (ICTs) has transformed and become central to contemporary societies. Presently, no aspect of human endeavour vis-avis sciences, arts, administration, crafts, commerce, medicine, accounting, etc. does not make use of ICT in its day-to-day operation. ICT refers to “the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numeric information by a micro-electronics-based combination of computing and telecommunications devices” (Kyeremeh, Prempeh, & AffulForson, 2019). ICT is a term that stresses the role of unified communications and the integration of telecommunications (Telephone lines and Wireless signals), computers as well as necessary enterprise software, middleware, storage and audiovisual systems, which enable users to access, store, transmit and manipulate information (Murray, 2011). Information technology comprises hardware and software, IT controls frameworks, and the human resources and skills required to develop, use and control these products and processes, to generate information to support decision making, operations, and organization strategies. It has transformed the way organisations perform their daily tasks (Lim, 2013).

Computers and other digital technologies have improved corporate relationships (Taiwo & Agwu, 2016); increased corporate and office productivity (Lim, 2013; Taiwo & Agwu, 2016); enabled research via collaboration (Lim, 2013); and, increased value creation across organizations (Taiwo & Agwu, 2016). It revolutionised the way organisations conduct their daily activities, providing vital information for planning, organizing, directing, leading, and controlling organisational activities (Ganyam & Ivungu, 2019). In addition, it also affected the manner accountants perform their duties enabling them to provide quality information for improved decision-making (Dandago & Rufai, 2014). Such advancements led to the development of Computerised Accounting Systems (CAS). A CAS is an accounting information system that processes financial transactions and events as per Generally Accepted Accounting Principles (GAAP) to produce reports with the assistance of computers or automated devices (Kingi, 2013). In a computerised accounting system, the framework of storage and processing of data is called the *operating environment* and consists of both hardware and software.

With a particular emphasis on accounting information systems, ICT led to the involvement of computers in performing accounting functions in organisations and the creation of accounting software packages. Nowadays any organisation that wants to stay competitive and survive a turbulent environment must do so with due consideration of ICT (Akanbi & Adewoye, 2018).

Performance is often used to measure the success of a business entity. Organisational performance is a measure of the change in the state of an organization or the outcomes that result from management decisions and the execution of those decisions by members of the organisation (Carton & Hofer, 2006). Organisational performance is multidimensional in nature; however, despite the diversity of performance measures, the common categorization is to divide performance into financial and non-financial performance (Combs, Crook, & Shook, 2005). Presently, CAS are been used to augment accounting functions (Taiwo, 2016). CAS has several benefits over manual systems such as speed, accuracy, reliability, backup, and flexibility, among others.

Nigeria remains the largest oil producer in Africa with an estimated production of 2.28 million barrels a day (ranking 13th in the world). The Nigerian oil and gas sector has been the mainstay in the economy, accounting for over 70% of its revenue. A vast number of oil and gas firms are located in Port Harcourt, the capital of Rivers State in Nigeria. It is located in the southsouth geopolitical zone, also referred to as the Niger Delta region.

Original Article

However, a recurring theme among researchers has been whether the utilisation of CAS has over time improved operational efficiency and business performance. The problems tackled in this study are as follows; Firstly, while extant studies have been conducted in Nigeria on Accounting Information Systems (AIS) in general; little research has specifically addressed its impact in the Oil and Gas sector. Akanbi and Adewoye (2018), Akesinro and Adetoso (2016), Dandago and Rufai (2014), Agbim (2013) focus on Deposit Money Banks; Ironkwe and Nwaiwu (2018) focus on manufacturing companies; Amahalu, Abiahu, and Obi (2017) sampled two Microfinance Banks (MFBs); Taiwo and Agwu (2016), Taiwo (2016) used a sample from Covenant University; Akande (2016) utilised a sample of SMEs; and, Onaolapo and Odetayo (2012) selected construction companies.

This forms the milieu upon which the study is set out to examine the effect of computerized accounting systems on the organisational performance of oil and gas firms. Against this backdrop, the study examines the effect of a computerized accounting system on the organisational performances of oil and gas firms in Port Harcourt. Studies have shown differing views on the merits/demerits of using computerized accounting systems and also industry variation with respect to organisational performance (Amahalu, Abiahu, & Obi, 2017).

Secondly, the literature on the effect of CAS focuses on differential aspects of organisational performance, such as the effect of CAS on payroll accounting (Alfred, 2014); CAS on external audit functions (Okoye & Oghoghomeh, 2011); and, CAS on service delivery (Okoye & Gbegi, 2012). The study focus on three aspects of organisational performance, namely accountability, productivity and cost control in the firms.

Objective of the Study

The main objective of the study is to examine the effect of computerized accounting systems on the organisational performance of oil and gas firms in Port-Harcourt, Nigeria. The study specifically examines the following:

1. To ascertain the effect of accounting software usage on the accountability of oil and gas firms.
2. To determine the effect of accounting software usage on the productivity of oil and gas firms.
3. To evaluate the effect of accounting software usage on cost control in oil and gas firms.

LITERATURE REVIEW Conceptual Review Computerised Accounting System (CAS)

A Computerised Accounting System (CAS) is a formal synergy between the computer, accounting and system. An accounting system is “a formal system for identifying, measuring, accumulating, analyzing, preparing, interpreting and communicating financial information of a particular entity to a particular group” (Ama, 2004). They emerged from advancements in information systems. Typical examples of information systems include management information system (MIS), transaction processing system (TPS), office automation system (OAS), decision support system (DSS), executive information system (EIS), expert system (ES) and accounting information system (AIS) (Al-Mamary, Shamsuddin, Hamid, & Aziati, 2014). The CAS assists in collecting and recording data and information regarding events that have an economic impact on organizations and facilitates its communication to internal and external stakeholders (Ganyam & Ivungu, 2019; Olusola, Olugbenga, Zacchaeus, & Oluwagbemiga, 2013). The fusion of ICT with accounting functions led to the creation of CAS. A CAS is an accounting information system that processes financial transactions and events as per Generally Accepted Accounting Principles (GAAP) to produce reports with the assistance of computers or automated devices (Kingi, 2013).

CAS is the application of computer-based software to input, process, store, and output accounting information (Sugut, 2014). Amviko (2011) opined that CAS involves the computerization of accounting information systems

Original Article

established to facilitate managerial decision-making. Marivic (2009) describes a CAS as a method or scheme for recording, organising, summarising, analysing, interpreting and communicating financial transactions of an entity to stakeholders via the use of computers and computer-based systems. This system uses specialized machines called calculators and computers in gathering information. Technically it is often referred to as Electronic Data Processing (EDP) System (Ama, 2004). They allow financial statements to be created from information stored in the database (Amahalu, Abiahu, & Obi, 2017).

Computer-based transaction system helps disseminate routine and critical business information speedily and efficiently (Lim, 2013). The use of IT applications changed various stakeholders' expectations to the need for access to more frequent and detailed accounting information and data, rather than periodical aggregated financial reports. Presently, CAS are responsible for analysing and monitoring the financial condition of companies, preparation of documents necessary for tax purposes, and providing information to support many other organizational functions such as production, marketing, human resource management, and strategic planning. The functions of CAS include (Taiwo & Agwu, 2016): effective collection and storage of data; classification of financial information; summarizing and interpretation of financial information to external users.

Accounting software is an integral part of the computerised accounting system. Accounting software is a class of computer programs that perform accounting operations (Ware, 2015). It is application software that records and processes accounting transactions within functional modules such as accounts payable, accounts receivable, payroll, and trial balance (Ware, 2015). They vary from small accounting software systems, such as Myob and QuickBooks, to large accounting software systems usually integrated with enterprise-wide software, such as Enterprise Resource Planning (ERP) systems, and Systems Applications and Products (SAP). The three basic types of commercial accounting information system software. These are turnkey systems, backbone systems, and vendor-supported systems. Turnkey systems are finished and tested systems. They are ready for implementation in the business process. Examples are Enterprise Resource Planning (ERP) systems, Oracle and SAP. Backbone Systems consist of basic system structures on which to build. In this approach, the primary logic is preprogrammed and the vendor will be the one to design the user interface that suits the client's needs. Vendor-supported systems are customized systems, in which, the software vendor designs, implements and maintains the system for its client.

Organisational Performance

Organisational performance is a measure of the change in the state of an organization or the outcomes that result from management decisions and the execution of those decisions by members of the organisation (Carton & Hofer, 2006). According to Carton (2004), organisational performance is based on the premise of using human, physical, and capital resources to achieve a shared purpose. The organisational performance comprises the actual output or results of an organisation as measured against its intended outputs (or goals and objectives). According to Richard, Devinney, Yip, and Johnson (2009) organisational performance encompasses three specific areas of firm outcomes: financial performance (profits, return on assets, return on investment, etc.), product market performance (sales, market share, etc.); and shareholder return (total shareholder return, economic value added). They further observed that firm performance can also be measured based on subjective indicators such as customer satisfaction, employee satisfaction, and social and environmental performance (Richard, Devinney, Yip,

Original Article

& Johnson, 2009). The study focuses on three aspects of organisational performance: accountability, productivity, and cost control in oil and gas firms.

Computerised Accounting System (CAS) and Organisational Performance

Studies have illustrated that the CAS has several benefits for numerous organisational functions. For instance, Okoye and Oghoghomeh (2011) demonstrated their usefulness in external audit functions. According to Sugut (2014), it eases auditing and has better access to required information such as cheque numbers, payments, and other transactions which helps reduce the time needed to provide this type of information and documentation during auditing. Computerization saves time on transactions leading to higher financial reporting quality. CAS facilitates an efficient information flow which enhances managerial decision-making. Therefore, it speeds up routine business transactions, timeliness, quick analysis, accuracy and reporting (Sugut, 2014). Agbim (2013) found that CAS enables the management to monitor the financial performance of all segments of a business because of the availability of a broad range of detailed reports at a short interval. Amviko (2011) found that CAS is positively associated with improved business performance. In Nigeria, Agbim (2013) from a survey dataset find that CAS improved business turnover and profitability. This was supported by Onaolapo and Odetayo (2012) in Nigeria who showed that CAS has a significant positive effect on organisational effectiveness.

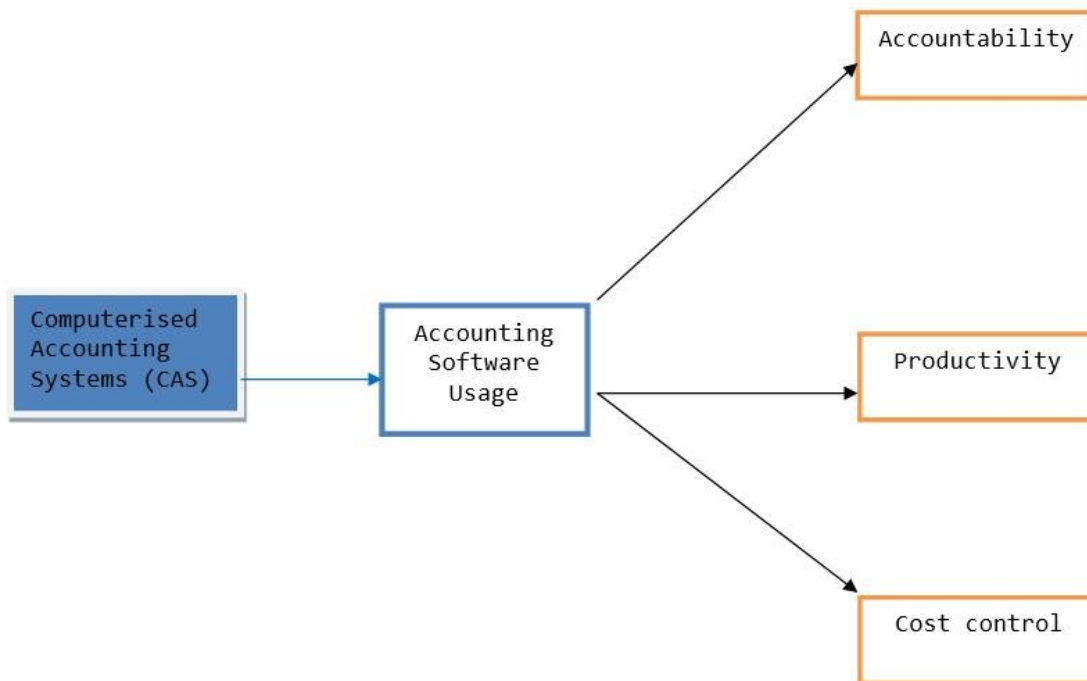


Figure 1: Conceptual Framework

Source: Author's Conceptualisation (2021)

Theoretical Framework

The study is anchored on the *diffusion of innovation* theory and the *technology acceptance model*.

Diffusion of Innovation (DOI) Theory

This theory was developed by E. M. Rogers, a communication theorist at the University of New Mexico, in 1962. According to Rogers (2003) innovation refers to the introduction of any

Original Article

“idea, practice or object that is perceived to be new”. Innovation has two parts, the first is “the generation of an idea or invention” and the second is “the conversion of that new idea or invention into a business or other useful application” (Rogers, 2003). The theory identifies five characteristics of innovations which affect their diffusion: *relative advantage* (the extent to which technology offers improvements over currently available tools), *compatibility* (its consistency with social practices and norms among its users), *complexity* (its ease of use or learning), *trialability* (the opportunity to try an innovation before committing to use it), and *observability* (the extent to which the technology’s outputs and its gains are clear to see). These five factors influence the adoption of innovation to a different extent among five different adopter categories. The criterion for the categorization is *innovativeness*. This is defined as the degree to which an individual is relatively early in adopting a new idea than other members of a social system (Rogers & Shoemaker, 1971). The five categories are the innovators, often the first to try a new idea. The early adopters, often occupy leadership roles and embrace change as a part of life. Early majority, often jump the wagon after observing whether such innovation is worthwhile. The fourth is the late majority, they are sceptical of change. They often follow the majority of success stories. The final group is the laggards, i.e., they are the most conservative of all. They are often hesitant and even resistant to change.

Technology Acceptance Model (TAM)

The TAM was originally proposed by Davis in 1986. This model forecasts a user’s acceptance and usage of ICT in an organisational setting (Akanbi & Adewoye, 2018). TAM deals with perceptions as opposed to real usage, the model suggests that users, the key factors that influence their decision on how, where and when they will use it (Davis, 1989). The model suggests that when users are presented with a new technology, two specific factors influence their decision about how and when they will use it (Alfred, 2014). The two factors are; perceived usefulness (PU), and perceived ease-of-use (PEOU) (Davis, 1989). According to Davis (1989), Perceived Usefulness (PU) is the degree to which a person believes that using a particular system will lead to improved performance; and, Perceived Ease-of-Use (PEoU) is the degree to which a person believes that using a particular system would result to improved productivity.

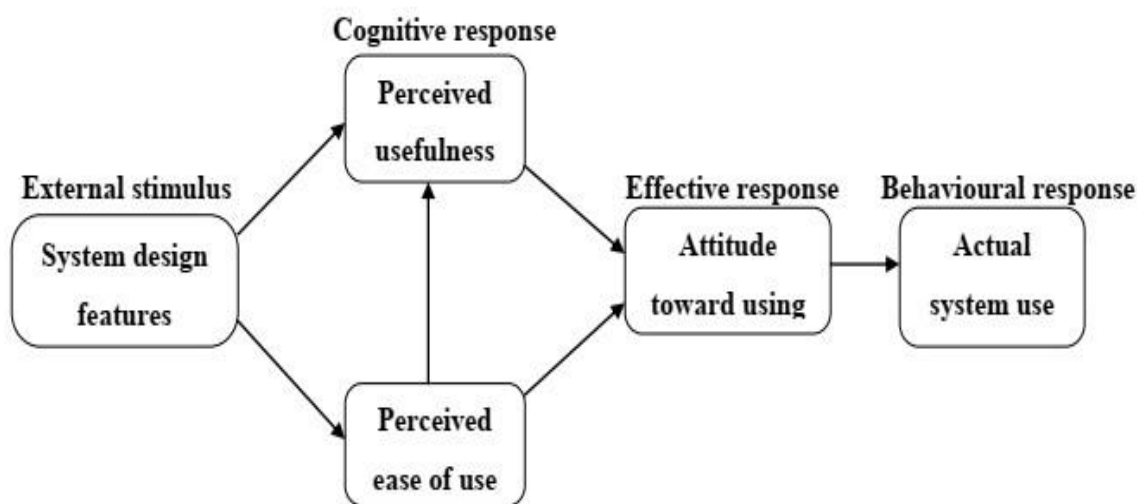


Figure 2: Technology Acceptance Model

Source: Davis (1993)

Original Article

Empirical Review

Masanja (2019) investigated 'The impact of computerized accounting system on the financial performance for selected private companies in Arusha, Tanzania'. The study adopted the descriptive and exploratory research design. The sample comprised of 61 employees in the accounting and financial department from 10 randomly selected private companies located in the Arusha region. The study is based on primary data; obtained from questionnaires. The data were analysed using descriptive and Pearson correlation coefficients. The results showed that cost and management support were significant factors affecting the adoption of CAS. The correlation results showed a significant positive relationship between these two factors (cost and management support) and financial performance.

Kyeremeh, Prempeh, and Afful Forson (2019) conducted a study titled 'Effect of information communication and technology (ICT) on the performance of financial institutions (A case study of Barclays Bank, Sunyani Branch)'. The study adopted both exploratory and descriptive research designs. The study relied on primary data which was collected using structured questionnaires. The sample comprised 50 respondents (i.e., 8 staff members and 48 customers) of Barclays Bank drawn using purposive and systematic sampling techniques. The data were analysed using descriptive statistics. The results revealed that ICT has a positive effect on performance from improved customer service delivery.

Akanbi and Adewoye (2018) investigated the 'Effects of accounting information system adoption on the financial performance of the commercial banks in Nigeria'. The study adopts the survey research design. The sample comprised 80 respondents randomly selected from commercial banks in the Lekki Peninsula Area of Lagos State, Nigeria. The study relied on primary data from questionnaires; and secondary data from financial reports from 2007 to 2017. The results were analysed using the linear regression technique. The results showed that Accounting Information System (AIS) adoption has a significant positive impact on gross profit margin, net operating profit, return on capital employed and return on total assets with $\alpha < 0.05$.

Ironkwe and Nwaiwu (2018) examined the effect of the 'Accounting information system on financial and non-financial measures of companies in Nigeria'. The sample comprised 16 companies. The study relied on both primary and secondary data. The primary data were obtained from questionnaires; while, the secondary data was obtained from annual reports from 2011 to 2014. The data were analysed using multiple linear regression techniques. The results showed that the CAS had a positive significant effect on the financial and non-financial indicators of companies.

Borhan and Nafees (2018) conducted a study titled 'Effect of accounting information system on financial performance: A study of selected real estate companies in Jordan'. The study employed a survey research design. The study relied on primary data collected via questionnaires administered to 175 employees from 5 companies in Jordan. The data were analysed using the linear regression technique. The results revealed that there is a significant impact of CAS on financial performance.

Kashif (2018) evaluated the 'Impact of accounting information system on the financial performance of selected FMCG companies'. The study adopts the survey research design. The sample comprised 400 respondents from the selected companies in India. The study relied on primary data obtained from questionnaires. The data were analysed using a simple linear regression technique. The results showed that there is a significant impact of CAS on financial performance.

Original Article

Rehab (2018) undertook a study titled 'The impact of accounting information systems on organisational performance: The context of Saudi's SMEs'. The sample comprised 137 small and medium enterprises (SMEs) in Saudi Arabia. The study relied on primary data collected via questionnaires. The data were analysed using smart partial least squares and validated the hypotheses. The results showed that AIS has a significant impact on organisational performance; and, specifically on cost reduction, improving quality and effective decision making.

Borhan and Bader (2018) investigated 'The Impact of accounting information system on the profitability of Jordanian Banks'. The study adopts the survey research design. The study relied on primary data collected through self-administered questionnaires from 206 employees in Jordanian banks. The data were analysed using the linear regression technique. The results showed that there is a significant impact of CAS on the profitability of banks.

Peter, Kamau, and Ombui (2018) examined the 'Effects of computerized accounting system on the performance of small medium enterprises: A case of the business community in Bomet County'. The study adopted the descriptive survey research design. The sample comprised 254 respondents in Bomet County using a stratified random sampling technique. The study relied on primary data; obtained from questionnaires administered to the respondents. The data were analysed using descriptive statistics and regression analysis. The results revealed that CAS (i.e., QuickBooks, sage, pastel and tally accounting systems) significantly improved SMEs' performance.

Khan (2017) investigated the 'Impact of accounting information system on the organizational performance: A case study of Procter and Gamble. The study adopted the descriptive survey research design. The sample comprised 174 employees of P&G Limited. The study relied on primary data obtained from self-administered questionnaires. The data were analysed using linear regression analysis. The results revealed a significant impact of CAS on organisational performance (i.e., marketing, job, and financial performance).

Amahalu, Abiahu, and Obi (2017) conducted a study titled 'Comparative analysis of computerized accounting system and manual accounting system of quoted Microfinance Banks (MFBs) in Nigeria'. The study adopted the ex-post facto research design. The sample comprised two Microfinance Banks (MFBs). The study relied on secondary data obtained from annual reports and accounts from 2006 to 2015. The data were analysed using paired sample ttest. The results showed that CAS had a positive effect on ROA, NPM, and ROE.

Akesinro and Adetoso (2016) undertook a study titled 'The effects of computerized accounting system on the performance of banks in Nigeria'. The study adopted a survey research design and a convenience sampling technique was used. The sample comprised 50 respondents from 3 Deposit Money Banks (DMBs) in Nigeria. The study relied on primary data; which were analysed using correlation analysis. The results showed that a computerized accounting system had a significant positive effect on a bank's profitability and customer patronage.

Taiwo and Agwu (2016) undertook a study titled 'Effect of ICT on accounting information system and organizational performance'. The study used the survey research design. The study relied on primary data obtained from a sample of 20 staff in financial services and related accounting departments at Covenant University. The data were analysed using Pearson's correlation via the aid of SPSS. The results showed a significant positive relationship between ICT and accounting system; and, a significant positive relationship between ICT and organisational performance.

Taiwo (2016) evaluated the 'Effect of ICT on accounting information system and organisational performance: The application of ICT on accounting information system'. The sample comprised 20 staff from the financial and

Original Article

accounting departments at Covenant University. The study relied on secondary data. The data were analysed using Pearson's correlation technique. The results showed a significant positive relationship between ICT and accounting system; and, a significant positive relationship between ICT and organizational performance.

Ali, Bakar, and Omar (2016) conducted a study titled 'The critical success factors of accounting information system (AIS) and its impact on organizational performance of Jordanian commercial banks'. They surveyed 273 respondents in the Jordanian banking sector. The study relied on primary data collected via a structured questionnaire. The data were analysed using with PLS-SEM technique. The results revealed that service quality, information quality and system quality are significant AIS success factors for increasing organizational performance.

METHODOLOGY Research Design

The study adopts the descriptive survey research design. This research design allows researchers to gather information, summarize, present, and interpret it for clarification (Peter, Kamau, & Ombui, 2018). The choice of survey research design is based on the fact that surveys enable a researcher to obtain data about practices, situations or views at one point in time through questionnaires or interviews. The population of the study was drawn from five randomly selected Oil and Gas firms in Port Harcourt, Rivers State with a capital base of above 500 million. The unit of focus in the firms is the Accounting/Finance and the IT/ICT Department of the respective companies. The distribution of respondents that fall in the two categories which constitute the population is above 100. The study employed a purposive sampling method and selected fifty staff of the five Oil and Gas firms. The participants in this study were accounting/finance and information technology personnel in Oil and Gas firms.

Table 1: The distribution of respondents across firms

S/No	Sector	Accountants	ICT Experts
1	Nigerian National Petroleum Corporation	10	10
2	Shell Nigeria	10	10
3	Total Nigeria	10	10
4	Schlumberger	10	10
5	Chevron Oil Nigeria Ltd	10	10
	Total	50	50

Source: Field Survey (2021)

Sources of Data

The study relied on primary data obtained from a structured questionnaire administered to respondents. Primary data refers to data an investigator originates for the inquiry at hand. The study utilised a structured questionnaire. A questionnaire is a "formalized set of questions for eliciting information" (Agbim, 2013). The questionnaire was designed using both nominal and interval scales. The nominal scale was used for bio-data collection while the interval scale was used for questions on the issue to be addressed in the study. The interval scale was structured in a Likert scale form and weighting given to each point in the scale as follows: Strongly Agree (SA) = 5 points; Agree (A) = 4 points; Strongly Disagree (SD) = 1 points; Disagree (D) = 2 point; Undecided (UD) = 3 points.

Original Article

The questionnaire consisted of 17 items arranged as follows: Questions 1-5 focused on the usage of accounting software; Questions 6-9 focused on the accountability construct; Questions 10-13 focused on the productivity measure; while Questions 14-17 addressed an issue related to cost control. The reliability of the instrument was calculated using Cronbach's alpha coefficients to assess the reliability of multiple-item constructs.

Methods of Data Analysis

The study employs both descriptive and inferential statistical techniques. The descriptive statistics include the mean, median, standard deviation, minimum, and maximum values. The hypotheses were tested using simple linear regression. Simple linear regression analyses the relationship between a dependent variable and one independent variable by estimating coefficients for the equation on a straight line. The goodness of fit of the model is evaluated using the Coefficient of Determination (R-squared). The analyses were conducted using the Statistical Package for Social Sciences (SPSS) Ver. 22 statistical software.

Model Specification

The following models were used to examine the relationship between the independent and dependent variables of the oil and gas firms:

$$\text{Acc} = f(\text{acs}) \dots\dots\dots (1)$$

$$\text{Pro} = f(\text{acs}) \dots\dots\dots (2)$$

$$\text{Cco} = f(\text{acs}) \dots\dots\dots (3)$$

Equations 1-3 can be written econometrically as presented in equations 4-6 as follows:

$$\text{Acc} = \eta_0 + \eta_1 \text{acs} + \varepsilon_t \dots\dots (4)$$

$$\text{Pro} = \eta_0 + \eta_1 \text{acs} + \varepsilon_t \dots\dots (5)$$

$$\text{CCo} = \eta_0 + \eta_1 \text{acs} + \varepsilon_t \dots\dots (6) \text{ Where:}$$

Acc	=	Accountability
Pro	=	Productivity
Cco	=	Cost Control
Acs	=	Accounting Software Usage
η_0	=	Constant or Intercept
η_1	=	Coefficient to be estimated
ε_t	=	Error term

Data Analysis

A total of eighty-nine (89) were fully completed and returned. This represents an approximate eighty-nine (89%) success rate. The total number of invalid questionnaires was eight (8) and partly completed questionnaires were three (3). The summary of the demographic information of the respondents is shown below:

Table 2: Demographic information of the respondents

Demographic profile	Frequency	Percentage (%)
Age:		
25-35	29	32.58
36-45	37	41.57

Original Article

	45 & above	<u>23</u>	<u>25.85</u>
		89	100
Gender:	Male	57	64.04
	Female	<u>32</u>	<u>35.96</u>
		89	100
Highest Educational			
Qualification:	WAEC/NECO/NABTEB	-	-
	Diploma	-	-
	Bachelor Degree		
	(HND, BSc, BA, etc.)	61	68.54
	Post-graduate		
	(PGD, MSc, PhD)	<u>28</u>	<u>31.46</u>
		89	100
Years of work experience:	5 years	11	12.36
	6 – 10 years	33	37.08
	11 – 15 years	27	30.34
	16 & above	<u>18</u>	<u>20.22</u>
		89	100

Source: Field Survey (September 2021)

The reliability of the instrument was tested using Cronbach Alpha (α), which is a measure of the internal consistency of a scale.

Table 3: Reliability statistics

	Cronbach's Alpha (α)	N of Items
Accounting Software Usage	.701	5
Accountability	.627	4

Original Article

Productivity	.633	4
Cost Control	.711	4

Source: SPSS Ver. 22

The questionnaire consisted of four subscales, the accounting software usage subscale consisted of 5 items (Questions 1-5) the Cronbach Alpha value was .701; the accountability subscale consisted of 4 items (Questions 6-9) the Cronbach Alpha value was .627; the productivity subscale consisted of 4 items (Questions 10-13) the Cronbach Alpha value was .633; and, the cost control subscale consisted of 4 items (Questions 14-17) the Cronbach Alpha value was .711. The subscales showed high-reliability scores; thus, indicating a high level of internal consistency of the instrument.

Descriptive Statistics Table 4: Descriptive statistics (Mean and Standard Deviation)

			Deviation	N	Min.	Max.
Mean Std.						
The organisation adopts the use of computerised						
89 1 accounting systems to process its financial transactions	5	4.63	.774			
Employees are trained regularly on the use of accounting						
89 1 software in the organisation	5	4.56	.783			
ICT is implemented at all levels/functional departments						
89 1 within the organisation	5	4.57	.865			
Computerised accounting systems facilitate internal report						
89 2 generation for management decision	5	4.19	.672			
The use of computerised accounting systems has						
facilitated the real-time monitoring and processing of	89 1 financial	5	4.06	.934		
transactions						
The use of electronic mediums for storing financial						
information has improved accountability within the	89 35	4.53	.524			
organisation						
A computerised accounting environment enables the	89 1	5	3.40	1.268		
systematic monitoring of activities						

Source: SPSS Ver. 22

Table 4 above shows the computed descriptive statistics of the questionnaire items used in the study. N shows the number of respondents that responded to a particular item, Min. shows the least observed value on a five-point Likert scale by the respondents to a particular item, Max. implies the maximum observed value on a five-point Likert scale by the respondents to a particular item. The mean is a measure of central tendency, the average value of the accounting software usage subscale (Questions 1-5) was 4.402; the average value of the accountability subscale (Questions 6-9) was 3.375; the average value of the productivity subscale (Questions 10-13) was 4.55;

The computerised accounting system has reduced the

Original Article

incidence of data loss from the physical destruction of 89 1 manual accounting records 4 2.22 .926

The computerised accounting system has improved the

89 2 reliability of financial reports

By decreasing the amount of time needed for processing 5 3.35 1.159

transactions, the computerised accounting system has 89 1 made more efficient our processes 5 4.73 .579

Computerised accounting systems facilitate the speedy

89 1 generation of reports 5 4.57 .810

The use of accounting software has expanded the skill-set

89 3 of the employees 5 4.70 .611

Computerised accounting software is highly efficient at

89 3 performing repetitive tasks 5 4.20 .643

The computerised accounting systems can handle large

89 2 volumes of transactions with minimal errors

The computerised accounting systems provide real-time 5 4.08 .907

valid information useful for monitoring costs along the 89 1 production lines and managerial decisions 5 4.52 .624

The computerised accounting system plays a key role in

89 3 supply chain management and inventory tracking 5 4.75 .459

A computerised accounting system has a significant

89 1 impact on financial management 5 4.51 .943

Valid N (listwise) 89

and, the average value of the cost control subscale (Questions 14-17) was 4.465. Thus, on average, all the subscales showed a mean score above 3.00.

Test of Hypotheses

The three (3) key hypotheses developed for the study were tested using simple linear regression; the results are shown below:

Analysis of Hypothesis One:

H₁: There is a significant effect of accounting software usage on the accountability of oil and gas firms.

Table 5: Model summary of hypothesis one

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

Original Article

1	.202 ^a	.041	.030	2.07979
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a. Predictors: (Constant), Accounting Software Usage

Source: SPSS Ver. 22

The Table above shows information pertaining to the model summary. The model showed an R squared value of .041; this explains the proportion of variance in the dependent variable explained by the independent variable. The Adjusted R squared value of 0.030 implies that accounting software usage explains about 3% of accountability in oil and gas firms. **Table 6: ANOVA^a output of hypothesis one**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	15.927	1	15.927	3.682	.058 ^b
Residual	376.320	87	4.326		
Total	392.247	88			

a. Dependent Variable: Accountability

b. Predictors: (Constant), Accounting Software Usage

Source: SPSS Ver. 22

The Table above shows the F-statistic (ratio of the mean regression sum of squares divided by the mean error sum of squares) which is used to check the statistical significance of the model. The F-statistic value of 3.682 ($p = .058$); thus, the p -value is less than .05 therefore the hypothesis that all the regression coefficients are zero is rejected. **Table 7: Model Coefficients^a of hypothesis one**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	9.204	2.253		4.086	.000
Accounting Usage Software	.195	.102	.202	1.919	.058

a. Dependent Variable: Accountability

Source: SPSS Ver. 22

The Table above shows the value of the coefficients of the model. The t-statistic of our variable of interest (Accounting Software Usage) is 1.919 ($p=.058$), this confirms that the variable has a positive and statistically significant effect; the alternate hypothesis is accepted and null rejected. Thus, there is a significant effect of accounting software usage on the accountability of oil and gas firms.

Analysis of Hypothesis Two:

H₁: There is a significant effect of accounting software usage on the productivity of oil and gas firms.

Original Article

Table 8: Model summary of hypothesis two

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.382 ^a	.146	.136	1.34556

a. Predictors: (Constant), Accounting Software Usage

Source: SPSS Ver. 22

The Table above shows information pertaining to the model summary. The model showed an R squared value of .146; this explains the proportion of variance in the dependent variable explained by the independent variable. The Adjusted R squared value of 0.136 implies that accounting software usage explains about 13.6% of productivity in oil and gas firms.

Table 9: ANOVAa output of hypothesis two

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	26.843	1	26.843	14.826	.000 ^b
Residual	157.517	87	1.811		
Total	184.360	88			

a. Dependent Variable: Productivity

b. Predictors: (Constant), Accounting Software Usage

Source: SPSS Ver. 22

The Table above shows the F-statistic (ratio of the mean regression sum of squares divided by the mean error sum of squares) which is used to check the statistical significance of the model. The F-statistic value of 14.826 ($p = .000$); thus, since the p -value is less than .05 therefore the hypothesis that all the regression coefficients are zero is rejected.

Table 10: Model Coefficients^a of hypothesis two

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	12.618	1.457		8.658	.000
Accounting Usage Software	.254	.066	.382	3.850	.000

a. Dependent Variable: Productivity

Original Article

Source: SPSS Ver. 22

The Table above shows the value of the coefficients of the model. The t-statistic of our variable of interest (Accounting Software Usage) is: 3.850 ($p=.000$), this confirms that the variable has a positive and statistically significant effect; the alternate hypothesis is accepted and null rejected. Thus, there is a significant effect of accounting software usage on the productivity of oil and gas firms.

Analysis of Hypothesis Three:

H₁: Accounting software usage affects cost control in oil and gas firms.

Table 11: Model summary of hypothesis three

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.348 ^a	.121	.111	1.51456

a. Predictors: (Constant), Accounting Software Usage

Source: SPSS Ver. 22

The Table above shows information pertaining to the model summary. The model showed an R squared value of .121; this explains the proportion of variance in the dependent variable explained by the independent variable. The Adjusted R squared value of 0.111 implies that accounting software usage explains about 11.1% of cost control in oil and gas firms.

Table 12: ANOVAa output of hypothesis three

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	27.531	1	27.531	12.002	.001 ^b
Residual	199.570	87	2.294		
Total	227.101	88			

a. Dependent Variable: Cost Control

b. Predictors: (Constant), Accounting Software Usage

Source: SPSS Ver. 22

The Table above shows the F-statistic (ratio of the mean regression sum of squares divided by the mean error sum of squares) which is used to check the statistical significance of the model. The F-statistic value of 12.002 ($p = .001$); thus, since the p -value is less than .05 therefore the hypothesis that all the regression coefficients are zero is rejected.

Table 13: Model Coefficients^a of hypothesis three

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		

Original Article

1 (Constant)	12.198	1.640		7.436	.000
Accounting Software Usage	.257	.074	.348	3.464	.000

a. Dependent Variable: Cost Control

Source: SPSS Ver. 25

The Table above shows the value of the coefficients of the model. The t-statistic of our variable of interest (Accounting Software Usage) is 3.464 ($p=.000$), this confirms that the variable has a positive and statistically significant effect; the alternate hypothesis is accepted and null rejected. Thus, accounting software usage affects cost control in oil and gas firms.

DISCUSSION OF FINDINGS

The study broadly investigated the effect of a CAS on organisational performance. Generally, the results are all suggestive of a positive effect of CAS on organisational performance. This is consistent with the study by Khan (2017) using Procter and Gamble as a case study which revealed a significant impact of accounting information systems on overall organisational performance (i.e., marketing, job, and financial performance). Also, studies by Taiwo and Agwu (2016), and Taiwo (2016) using a sample drawn from Covenant University, Nigeria showed a significant positive relationship between ICT and the accounting system; and, a significant positive relationship between ICT and organisational performance. Using a sample of selected construction companies the study by Onaolapo and Odetayo (2012) showed a significant positive effect of accounting information systems on organizational effectiveness.

The *first hypothesis* showed a significant positive effect of accounting software usage on the accountability of oil and gas firms. The study by Ironkwe and Nwaiwu (2018) showed that accounting information systems had a significant positive effect on both financial and nonfinancial indicators of companies.

The *second hypothesis* revealed a statistically significant positive effect of accounting software usage on the productivity of oil and gas firms. The study by Kyeremeh, Prempeh, and Afful Forson (2019) found a positive effect of ICT on performance from improved customer service delivery. Another study by Akanbi and Adewoye (2018) using a sample of commercial banks in Lagos State, Nigeria and linear regression showed that the adoption of Accounting Information System (AIS) had a significant positive impact on gross profit margin, net operating profit, return on capital employed and return on total assets. Other studies include studies by Borhan and Nafees (2018) in Jordan which revealed a significant impact of accounting information systems on financial performance; Kashif (2018) in India found a significant impact of accounting information systems on financial performance; Borhan and Bader (2018) on a sample of Jordanian Banks found a significant impact of accounting information system on profitability. Amahalu, Abiahu, and Obi (2017) from a sample of quoted Microfinance Banks (MFBs) in Nigeria showed that computerized accounting systems had a positive effect on ROA, NPM, and ROE. Akesinro and Adetoso (2016) also found that CAS had a significant positive effect on a bank's profitability and customer patronage.

Interestingly, the study by Peter, Kamau, and Ombui (2018) on a sample of SMEs in Bomet County revealed that CAS (i.e., QuickBooks, sage, pastel and tally accounting systems) significantly improve SMEs' performance.

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Another study by Akande (2016) in South Western, Nigeria revealed a significant positive relationship between CAS and entrepreneur performance. Using a sample of SMEs in Iran Mehdi, Mahmoud, Mostafa, and Ebadollah (2015) found that implementation of AIS was positively associated with performance, productivity, and profitability (measured by P/E ratio and Tobin's Q).

Other studies have also shown support for the use of CAS in organisations; such as Ware (2015), Boateng (2015), and Agbim (2013) found support for the use of computers in keeping accounting records; Boateng (2015) showed that benefits of CAS outweigh its associated challenges; Sugut (2014) showed that CAS had a significant positive effect on financial reporting quality; and, Amviko (2011) found a positive association between CAS and timely financial reporting.

The *third hypothesis* showed that accounting software usage positively affects cost control in oil and gas firms. This corroborates the study by Masanja (2019) on a sample of selected private companies in Arusha, Tanzania. The correlation results showed a significant positive relationship between cost and management support with financial performance. The study by Rehab (2018) on a sample of SMEs in Saudi and smart partial least squares showed that AIS had a significant impact on organizational performance; and, specifically on cost reduction, improving quality and effective decision making. Similar results were also documented by Yose and Choga (2016) in Zimbabwe who found that CAS reduces errors, saves time, and minimises operational costs. The study by Dandago and Rufai (2014) on a sample of banks from the Nigerian banking industry showed that accounting information technology improved banks' performance by reducing operational costs and by facilitating transactions among customers within the same or different networks.

Conclusion and Recommendations

The study concludes that CAS plays a role in the organisational performance of oil and gas firms in Port-Harcourt, Nigeria. The rapid development in information and communication technology caused a tremendous change in financial accounting practices across several organisations (i.e., both product and service sectors). Thus, several computer hardware and software were deployed as analytical tools in several organisations. The study focuses on accounting software used as an aid in the analytical process and its consequent effect on accountability, productivity and cost control among oil and gas firms in Port-Harcourt, Nigeria. The study adopts the survey research design to elicit the views of respondents by administering a questionnaire. The sample was drawn from oil and gas firms located in Port-Harcourt. The empirical results revealed a positive statistically significant effect of accounting software usage on accountability, productivity and cost control. However, the effect of accounting software usage on the accountability of oil and gas firms was significant at 10%. Based on this, the recommendations that managers in oil and gas firms:

1. The use of electronic mediums and other alternative channels (such as cloud computing frameworks) for storing financial information ensures the safeguarding of such information and the prevention of data loss. In addition, the computerisation of the accounting process enables the real-time monitoring of transactions to improve accountability within the organisation;
2. The deployment of computerised accounting systems in functional departments to boost the efficiency of service delivery. This becomes needful following the large voluminous transactions that can be processed using personal computers compared to manual systems. In addition, the linkage of the system to the overall

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organisational ICT framework can enable the speedy generation of internal and external financial reports. However, the organisation should ensure the regular training of its employees and also the prevention of such cyber security attacks; and,

3. The computerised accounting systems can enable automation of highly repetitive tasks thus enabling the firm cut down costs. In addition, the real-time monitoring of costs along production lines enables managerial decisions and inventory tracking. Lastly, the deployment of a computerised accounting system plays a significant role in resource monitoring, fixed assets and financial management.

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