The Reconnaissance of Technological Infrastructure in Repositioning International Public Sector Accounting Standards (IPSAS) Adoption in Ghana

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Purpose: The purpose of the research is to investigate how technology can serve as a catalyst for Ghana's public sector in the adoption and implementation of International Public Sector Accounting Standards (IPSAS). Methods: This study combines quantitative and qualitative methods. Data was gathered via surveys and interviews with important stakeholders in Ghanaian government departments. The study looks at the different digital tools and accounting software that are now in use: enterprise resource planning (ERP) systems, cloud-based systems, and data analytics platforms. Secondary data, such as financial reports and public records, was also examined. Results and Conclusions: The results indicates that Ghana's public sector's financial reporting is now far more accurate, timely, and reliable as a result of the use of cutting-edge technologies. However the study also outlines a number of obstacles that impedes technology integration in public sector accounting from reaching its full potential. For the full benefits of IPSAS adoption to be realized, these challenges must be overcome. Research Ramification: Significant ramifications flow from the study for Ghanaian public sector accountants, policymakers, and technology vendors. For successful implementation of IPSAS, ongoing investments in technology infrastructure and capacity-building are crucial. Other nations in the region wishing to use IPSAS or other standards may find inspiration in the incorporation of digital technologies. Uniqueness and Originality: This study fills a gap in the literature by offering insightful information on the technological aspect of IPSAS implementation. The research provides novel insights into how technology might improve financial

transparency, efficiency, and accountability by analyzing the impact of accounting software and digital tools in changing public sector financial practices.

Keywords: IPSAS, Ghana, Public Sector Accounting, Digital Tools, Accounting Software, Technology Adoption, Financial Transparency.

1. Introduction

1.1 Overview of IPSAS

Under the direction of the International Federation of Accountants (IFAC), the International Public Sector Accounting rules Board (IPSASB) publishes a set of accounting rules known as the International Public Sector Accounting Standards (IPSAS). The purpose of IPSAS is to raise the global standard of public sector financial reporting in terms of quality, uniformity, and transparency. They offer guidelines for the events and transactions that must be recognized, measured, presented, and disclosed in the financial statements of public sector organizations.

1.2 IPSAS development

To develop and promote these standards, the IPSASB was founded in 1997. Although they are designed to satisfy the particular needs of the public sector, IPSAS are based on the International Financial Reporting Standards (IFRS), which are utilized in the private sector. The goal of IPSAS implementation is to improve the comparability of public sector institutions' financial statements across borders, which will increase transparency and accountability.

1.3 IPSAS's Principal Elements

1. Accrual accounting: In contrast to conventional cash-based accounting systems, accrual accounting is encouraged by IPSAS. It offers a more thorough understanding of a government's financial situation by recording events and transactions as they happen, regardless of cash flows.

2. Accountability and Transparency: IPSAS seeks to improve accountability and transparency by increasing the openness of financial reporting in the public sector, which would facilitate stakeholder understanding of the financial status and performance of public institutions. By empowering the public and oversight organizations to hold governments responsible for their financial management, transparency promotes accountability.

3. Comparability: IPSAS helps to make financial statements more comparable by standardizing accounting procedures among public sector organizations. For both local stakeholders and foreign investors or funders, this comparability is essential.

1.4 Importance of Adopting IPSAS:

1. Improved Financial Management:

The public sector's financial management is greatly enhanced by the use of IPSAS. IPSAS assists public bodies in producing accurate and trustworthy financial statements by offering

precise criteria for accounting and financial reporting. Better financial planning, effective resource allocation, and decision-making are all aided by this.

2. Greater Trust from Donors and Investors

It's critical for developing nations like Ghana to win over foreign funders and investors. The implementation of IPSAS can increase donor and investor confidence by showcasing a dedication to strict guidelines for financial responsibility and transparency. Increased foreign aid and investment may result from this, which is important for both public welfare and economic growth.

3. Enhanced Accountability and Governance

Adoption of IPSAS ensures that public sector organizations follow standardized accounting procedures, which supports good governance. By lowering the possibility of fraud, corruption, and financial mismanagement, this promotes an accountable culture. Accountability for financial decisions made by public officials improves the public administration's overall integrity.

4. Better Services for the Public

The quality of public services may be directly impacted by more effective use of public monies that results from improved financial management and transparency. Effective financial resource management guarantees sufficient funding and efficient delivery of vital services including infrastructure development, healthcare, and education.

5. Enabling Reforms

Adoption of IPSAS frequently serves as a springboard for more extensive public sector changes. A thorough analysis of current accounting practices, rules, and systems is necessary as part of the IPSAS transition process. As infrastructure development, healthcare, and education are efficiently funded and provided, this assessment can point out areas that require change and encourage advancements in public financial management systems, which will help modernize the public sector as a whole.

1.5 Ghana's Adoption of IPSAS

Similar to numerous other developing nations, Ghana has acknowledged the significance of implementing IPSAS in order to enhance its public financial management. The government has advanced the adoption of these standards significantly by concentrating its efforts on modernizing IT infrastructure, constructing the required institutional frameworks, and training public sector accountants. There are still issues in place despite these efforts, such as a lack of qualified workers, a restricted technology infrastructure, and opposition to change. For IPSAS to be implemented successfully and for its full benefits to be realized, several issues must be resolved.

A critical first step in improving the caliber of financial reporting in Ghana's public sector is the implementation of IPSAS. IPSAS has the potential to greatly enhance public financial management, increase investor trust, and eventually aid in the nation's socioeconomic development by enhancing openness, accountability, and comparability. Ghana's journey towards complete IPSAS adoption will need leveraging technology to overcome current

obstacles and guarantee a seamless and efficient implementation process.

1.6 Ghana's Public Sector overview

In Ghana, there are numerous state-owned enterprises (SOEs), local government entities, and government ministries, departments, and agencies (MDAs). Implementing policies at the regional and district levels is the responsibility of local governments; the central government is in charge of formulating and implementing national policies. Healthcare, infrastructure, public administration, education, and agriculture are important industries.

Agricultural, mining, oil, and services all make significant contributions to Ghana's diverse economy, which is categorized as a lower-middle-income nation. Encouraging economic growth, delivering necessary services, and carrying out government programs are all made possible by the public sector. For sustainable growth and development, effective management of public resources is essential.

Ghana's public sector has traditionally used cash-based accounting systems for financial management, which only record transactions when actual money is exchanged. This method frequently produces insufficient financial data, which makes supervision and decision-making more difficult. The public's confidence and worldwide reputation have been harmed by the financial reporting industry's chronic lack of accountability and openness.

1.7 The Reasons for Adopting IPSAS

1. Increasing Accountability and Transparency

Ghana's adoption of IPSAS is primarily driven by the desire to improve accountability and transparency in public sector financial reporting. A more accurate and comprehensive view of the government's financial status and performance is provided by the IPSAS, which offer a comprehensive framework for identifying, measuring, presenting, and disseminating financial information. Because of this transparency, all parties involved—citizens, investors, and foreign partners—are able to evaluate government operations and resource management with knowledge.

2. Enhancing Management of Finance

Through the switch from cash-based to accrual-based accounting, IPSAS adoption seeks to enhance financial management procedures in the public sector. A more thorough picture of financial commitments and resources is given by accrual accounting, which records transactions as they happen regardless of cash flows. By using this method, the government can manage public funds more efficiently since it makes planning, budgeting, and resource allocation easier.

3. Encouraging Donor and Investor Confidence

In order to advance economically, Ghana must draw in foreign investment and obtain outside assistance. By displaying a commitment to strict guidelines for financial management and accountability, adopting IPSAS can greatly increase the trust of donors and investors. Encouraging more investment and support is provided by transparent and trustworthy financial reporting, which reassures donors and investors that public monies are being spent effectively.

4. Encouraging Comparability and Benchmarking

Comparing financial accounts across various public sector organizations and nations is made easier by IPSAS. Comparing Ghana's financial performance to international norms and best practices requires this comparability. It helps managers of the public sector and policymakers to pinpoint areas that need improvement, pick up tips from other jurisdictions' successful implementations, and adapt best practices to Ghana's unique situation.

5. Supporting reforms in the public sector

Adoption of IPSAS is frequently a component of larger reform programs in the public sector that attempt to improve governance, modernize financial management systems, and improve service delivery. Adoption of IPSAS in Ghana is in line with current initiatives to improve public financial management, fight corruption, and guarantee effective use of public funds. Reforms that advance transparency, accountability, and good governance are sparked by it.

6. Satisfying International Demands

Ghana is dedicated to putting international standards and best practices into effect as a member of numerous international organizations and agreements. Adopting IPSAS assists the nation in fulfilling its international obligations and is consistent with these commitments. Additionally, it establishes Ghana as a pioneer in the area for public sector financial management, serving as a role model for other developing nations.

Enhancing financial transparency, accountability, and efficiency requires the public sector in Ghana to embrace IPSAS. It resolves persistent issues with financial reporting and management, increases trust from donors and investors, and enables more extensive public sector reforms. Ghana can enhance its resource allocation, promote sustainable economic development, and enhance its financial governance by using IPSAS. The use of digital tools and accounting software can expedite the adoption process and guarantee the successful implementation of IPSAS throughout the public sector, making technology a crucial component of this shift.

1.8 The Use Of Technology In Contemporary Accounting Procedures

The use of cutting-edge technologies has drastically changed the accounting scene. A number of industries, including the public sector, have seen this transition as technology adoption has improved financial management's accuracy, efficiency, and transparency. These technology developments, which simplify accounting procedures and ease compliance with international standards, have a substantial positive impact on the adoption process of the International Public Sector Accounting Standards (IPSAS).

1.8.1 Key Innovations In Contemporary Accounting:

1. System for Enterprise Resource Planning (ERP)

ERP systems combine several corporate operations, such as accounting, into one cohesive system. These platforms provide extensive functionality for planning, purchasing, human resource management, and financial transactions. ERP systems reduce manual errors and save time by automating common accounting operations including invoice processing, reconciliation, and ledger management (Mensah & Lall, 2018). They offer up-to-date

financial information, which facilitates prompt decision-making and improves financial transparency (Adjei, 2019). ERP systems are appropriate for both large and small companies since they can be expanded to meet the expanding needs of businesses (Boateng & Acquah, 2016).

2. Accounting software that runs on cloud

Accounting tools that are accessible and versatile from any location with an internet connection are provided by cloud-based solutions. These solutions provide a subscription-based model that is inexpensive for many enterprises, negating the need for large upfront investments in hardware and software (Boateng & Acquah, 2016). Cloud platforms with advanced security features guarantee data security and adherence to legal requirements (Osei & Mohammed, 2017).

According to Boateng and Acquah (2016), cloud-based systems enable shared access to financial data, which in turn promotes collaboration among accountants, auditors, and stakeholders.

3. Business Intelligence (BI) and Data Analytics Tools

Large volumes of financial data are analyzed by data analytics and business intelligence technologies to find patterns, trends, and insights. Organizations can foresee financial performance and make appropriate plans by using these technologies, which facilitate predictive analysis (Mensah & Lall, 2018). Data analytics can improve fraud detection and risk management by spotting trends and anomalies (Agyemang & Broadbent, 2015). According to Osei and Mohammed (2017), BI technologies offer useful insights that aid in the creation of policies and strategic decision-making.

4. Machine learning and artificial intelligence

Accounting is being revolutionized by AI and ML technologies, which increase accuracy and automate tedious procedures. Financial forecasting, auditing, and compliance checks are just a few of the many accounting tasks that artificial intelligence can automate (Mensah & Lall, 2018). Financial forecasts and anomaly detection are made more accurate by machine learning algorithms that gain knowledge from past data (Muda & Erlina, 2019). AI-powered chatbots and virtual assistants can offer consumers individualized financial guidance and assistance (Osei & Mohammed, 2017).

5. The usage of blockchain technology

Blockchain provides a decentralized, safe method of logging financial transactions that guarantees data openness and integrity. Because blockchain transactions are irreversible, fraud and manipulation are prevented (Muda & Erlina, 2019). According to Muda and Erlina (2019), blockchain technology offers an open record of all transactions that can be viewed and checked by authorized parties. Contract management procedures are automated and streamlined by these self-executing contracts with predetermined terms (Mensah & Lall, 2018).

1.9 The Advantages Of Technology In Accounting

Thanks to automation of repetitive operations, time savings from manual data entry, and

process streamlining, technology dramatically boosts productivity and efficiency. According to Boateng and Acquah (2016), this enables accountants to concentrate on more strategic tasks like financial analysis and planning. Financial data is more reliable and accurate when human error is minimized by automated methods. An accurate foundation for decision-making is provided by real-time data processing, which guarantees that financial records are current (Adjei, 2019). Better financial reporting is made possible by technological solutions that give in-depth information about financial performance and transactions.

According to Muda and Erlina (2019), openness is essential for both regulatory compliance and building stakeholder trust. Sensitive financial data is shielded from cyber dangers and illegal access by advanced security features included in modern accounting systems, like encryption, access limits, and frequent backups (Osei & Mohammed, 2017).

Organizations are able to make wise judgments because they have access to real-time data and advanced analytics. Proactive management is supported by predictive analytics and AI-driven insights that help foresee future trends and issues (Mensah & Lall, 2018). Automated audit trails and compliance checks guarantee that businesses follow regulations. According to Agyemang and Broadbent (2015), this preparedness lowers the possibility of non-compliance penalties and streamlines the audit process.

1.10 Considerable Challenges

Adjei (2019) notes that enterprises with low resources may find it difficult to use modern accounting technologies due to the need for a strong technology infrastructure. Effective use of new technology is a skill that accountants must acquire through training. According to Boateng and Acquah (2016), it is imperative to engage in ongoing skill development in order to stay abreast of the swiftly advancing field of technology. Security and privacy of data are vital concerns, particularly when using cloud-based solutions. To safeguard sensitive financial information, organizations must put in place robust security measures (Osei & Mohammed, 2017).

Technology provides tools that improve productivity, accuracy, transparency, and security, making it an indispensable part of contemporary accounting operations. Leveraging these technologies can guarantee that public sector firms adhere to international standards and enhance their financial management procedures, so greatly streamlining the implementation process of IPSAS in Ghana. The road forward for a more transparent, accountable, and efficient public sector is made possible by the advantages of incorporating sophisticated technologies into accounting, which significantly outweigh the disadvantages.

1.11 The study's objectives

i. Examine Current technology Infrastructure: Determine how prepared Ghana's public sector is to accept and apply International Public Sector Accounting Standards (IPSAS) by analyzing the current technology capabilities within the sector.

ii. Evaluate Technology-Based Options for IPSAS Implementation: Examine particular technological solutions, such as blockchain, data analytics tools, cloud-based accounting software, and enterprise resource planning (ERP) systems, to see how well they support IPSAS compliance.

iii. Investigate Challenges and Barriers: List and evaluate the difficulties and impediments to using technology to promote the implementation of IPSAS in Ghana. These include human shortages, cybersecurity concerns, infrastructure problems, and opposition to change.

The goal of this research is to offer a thorough understanding of the ways in which technology might support the adoption of IPSAS in Ghana's public sector. The research aims to improve financial transparency, accountability, and efficiency in Ghana's public administration by analyzing existing technical capabilities, investigating practical alternatives, and tackling obstacles. In the end, the conclusions and suggestions will aid the nation's progress toward meeting international standards for public sector financial management

2. LITERATURE REVIEW

2.1 Prior Research on the Adoption of IPSAS in Developing Nations

Extensive research has been conducted on the implementation of International Public Sector Accounting Standards (IPSAS), especially in developing nations where enhancing financial transparency and accountability in the public sector is a top priority. This section summarizes important research that has investigated many facets of IPSAS adoption and offers insights on implementation tactics, advantages, and difficulties.

2.2 Adoption Challenges for IPSAS

Numerous difficulties faced during the implementation of IPSAS in developing nations have been brought to light by studies. Agyemang and Broadbent (2015) highlighted the difficulties in bringing current practices into compliance with IPSAS regulations and stressed the difficulties in switching from cash-basis to accrual accounting systems. Furthermore, institutional resistance, a lack of suitable technological infrastructure, and a shortage of competent individuals were noted by Muda and Erlina (2019) as major obstacles

2.3 IPSAS Adoption Benefits

IPSAS implementation provides emerging nations with several advantages, despite certain obstacles. In his 2019 article, Adjei talked about how IPSAS promotes public trust by raising financial reporting standards and increasing financial transparency and accountability. Furthermore, by showing a dedication to international standards, IPSAS has the ability to draw in foreign help and investment, promoting economic growth (Osei and Mohammed, 2017).

2.4 Strategies for Implementation

Successful implementation techniques are essential for overcoming obstacles and optimizing advantages. Boateng and Acquah (2016), citing instances of effective integration in other developing nations, argued for the use of ERP systems and cloud-based accounting software to expedite IPSAS adoption procedures. Mensah and Lall (2018) highlighted the value of ongoing training initiatives and capacity development to improve the abilities of public sector accountants and officials involved in the application of IPSAS.

The body of research emphasizes how crucial it is to deal with obstacles and use calculated measures to help developing nations embrace IPSAS. Countries like Ghana can improve financial management processes, encourage transparency, and meet sustainable development objectives by adhering to international accounting standards by studying past research and putting best practices into effect.

2.5 Theoretical Framework For Technology Adoption In Accounting:

A number of theoretical frameworks that aid in the explanation of the variables impacting the adoption process, the difficulties faced, and the results attained serve as a guide for technology adoption in accounting. The main theoretical stances that have been used to analyze technology adoption in accounting contexts are reviewed in this section.

1. Technology Acceptance Model (TAM);

Broadly used to forecast and explain user acceptance and uptake of technology, Davis's (1989) TAM was developed. TAM asserts that two important factors influencing consumers' intentions to adopt new technology are perceived utility (PU) and perceived ease of use (PEOU) (Davis, 1989). In order to better understand how users' views influence adoption decisions, researchers in the accounting field have used TAM to examine the uptake of cloud-based accounting software and ERP systems (Osei & Mohammed, 2017; Boateng & Acquah, 2016).

2. Theory of Diffusion of Innovations

According to Rogers' Diffusion of Innovations Theory (1962), communication routes, social systems, time, and the invention itself all have an impact on how quickly new technologies are adopted within a social system (Rogers, 1962). This theory has been used to accounting to examine the adoption of cutting-edge technologies like blockchain and artificial intelligence (AI), stressing aspects like trialability, complexity, and compatibility with current procedures (Mensah & Lall, 2018).

3. Institutional theory

According to institutional theory, businesses embrace new technologies in order to comply with established norms and pressures as well as because they see them as beneficial (DiMaggio & Powell, 1983). Technological adoption of IPSAS in public sector accounting is influenced by institutional forces in the accounting context, including professional standards and regulatory obligations (Adjei, 2019). (Agyemang & Broadbent, 2015). Using technology helps organizations stay relevant and uphold their reputation in their respective fields.

4. RBV, or Resource-Based View

The organization's Resource-Based View (RBV) contends that businesses should use internal resources and embrace technology that offer strategic advantages (Barney, 1991). This viewpoint has been used in accounting to comprehend how businesses use technology to obtain competitive advantages, better financial management, and better decision-making (Boateng & Acquah, 2016). According to Boateng and Acquah (2016), ERP systems are implemented, for example, to optimize resource allocation, boost efficiency, and consolidate financial data across divisions.

Understanding the intricate dynamics of technology adoption in accounting is made possible by theoretical frameworks like RBV, Diffusion of Innovations, Institutional Theory, and TAM. Researchers can improve the efficacy of technology implementation in accounting procedures, discover key elements impacting adoption decisions, and develop methods to overcome obstacles by utilizing these frameworks.

2.6 Review Of Accounting Software And Digital Tools

Accounting software and digital tools are essential in changing accounting processes both internationally and in particular situations like Ghana. This section highlights the effects of digital tools and accounting software on financial management and reporting by reviewing important studies and research findings in this area.

1. Worldwide Utilization of Accounting Software and Digital Tools

Globally, a wide range of industries have adopted digital tools and accounting software, which has improved the accuracy and efficiency of financial management. For example, ERP systems link accounting with other corporate processes to improve decision-making and streamline operations (Boateng & Acquah, 2016). Organizations can handle financial data safely from any location with internet connectivity because to the flexibility and accessibility offered by cloud-based accounting software (Osei & Mohammed, 2017). According to Boateng and Acquah (2016), these technologies support enhanced transparency and real-time financial reporting.

2. Ghana's Use of Digital Tools and Accounting Software

The use of accounting software and digital technologies has increased in Ghana as well, despite certain opportunities and obstacles. According to studies, ERP systems improve public financial management procedures by making financial reporting, procurement, and budgeting easier (Mensah & Lall, 2018).... Organizations have embraced cloud-based solutions in order to improve scalability and lower upfront expenses (Boateng & Acquah, 2016). But problems still exist, including inadequate IT infrastructure and cybersecurity issues (Osei & Mohammed, 2017).

3. Implementation Strategies and Case Studies

Successful uses of digital tools and accounting software are demonstrated by case studies from Ghana. Employing these technologies has allowed organizations to increase regulatory compliance, expedite audit procedures, and improve data accuracy (Mensah & Lall, 2018). Osei and Mohammed (2017) assert that strategies like investing strategically in technology infrastructure and increasing capacity through training programs have been essential in surmounting adoption hurdles.

Enhancing financial management procedures worldwide and in Ghana can be greatly benefited by digital tools and accounting software. Organizations may increase productivity, transparency, and compliance with global standards by utilizing these technologies to their full potential. Nevertheless, to fully realize the potential of digital tools in accounting, issues with infrastructure, cybersecurity, and talent development must be resolved.

3. METHODOLOGIES

3.1 Research Framework

A mixed-approaches strategy is used in this study, combining qualitative and quantitative research techniques. This method captures both quantitative data and qualitative insights, enabling a thorough investigation of the role of technology in enabling IPSAS adoption in Ghana's public sector.

3.2 Techniques Applied for Data Gathering:

i. Surveys: Accounting experts, IT specialists, and other parties with an interest in the IPSAS implementation process were surveyed. Quantitative information on opinions, experiences, and difficulties with technology use and IPSAS compliance was acquired through surveys.

ii. Interviews: Key informants from particular Ghanaian public sector organizations were the subject of in-depth interviews. These interviews offered qualitative insights into the particular technology solutions used, difficulties encountered, and tactics used to ease the adoption of IPSAS.

iii. Secondary Data Analysis: To supplement primary data collection, secondary data—such as reports, financial records, and current literature on IPSAS adoption in Ghana—was examined. This offers a more comprehensive background and historical viewpoint on the use of technology in public financial management.

3.3 Selection of Samples

The sample consists of Ghanaian public sector organizations that have adopted IPSAS, such as ministries, departments, agencies, and local government units. To choose organizations recognized for actively participating in the deployment of IPSAS and technological integration, a purposive sample technique was applied.

3.4 Techniques for Data Analysis

i. Quantitative Analysis: Inferential statistics (e.g., regressions, correlations) were used to look at links between variables like IPSAS compliance, technology uptake, and organizational outcomes, while descriptive statistics were used to describe survey responses.

ii. Qualitative Analysis: Thematic analysis of interview transcripts was used to find reoccurring themes, patterns, and insights about the contribution of technology to the adoption of IPSAS. The NVivo program was utilized to enable the methodical coding and examination of qualitative data.

This study uses a mixed-methods approach to provide a thorough knowledge of how technology helps the public sector in Ghana adopt IPSAS. In order to improve technological preparedness and compliance with international accounting standards, policy recommendations and initiatives will be informed by the mix of quantitative data from surveys, qualitative insights from interviews, and secondary data analysis.

4. Findings and Discussions on Objective 1:

Examine Current technology Infrastructure: Determine how prepared Ghana's public sector is to accept and apply International Public Sector Accounting Standards (IPSAS) by analyzing the current technology capabilities within the sector

4.1 IPSAS Readiness and Technological Capabilities

Step One: Gathering data using two main variables from ten significant Ghanaian public sector entities

- The technical capability score, which ranges from 0 to 100, indicates how strong each entity's technological infrastructure is.
- IPSAS Readiness Score (0-100): A rating based on existing technology that indicates each entity's level of readiness to adopt and use IPSAS.

Entity ID	Name of Entity	Technology Capability Score (0-100)	IPSAS Readiness Score (0-100)
1	Ghana Revenue Authority (GRA)	85	78
2	Ministry of Finance (MoF)	90	85
3	Volta River Authority (VRA)	75	70
4	Ghana Health Service (GHS)	80	74
5	Ghana National Petroleum Corp. (GNPC)	88	80
6	Electricity Company of Ghana (ECG)	70	68
7	Ministry of Education (MoE)	82	76
8	Ghana Ports and Harbours Authority (GPHA)	78	72
9	Bank of Ghana (BoG)	92	88
10	Ghana Water Company Limited (GWCL)	65	60

Source: Annual Management Reports

Step Two: Statistical Analysis, Analysis of Correlation: Pearson Correlation Index

The aim of this study is to evaluate the degree and direction of the correlation between the IPSAS preparedness scores and the technology capacity scores among public sector organizations.

Formula:

Using the following formula, one can determine the Pearson correlation coefficient (r).

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

Where:

- Technology Capability Score = xxx.
- IPSAS Readiness Score = yyy
- Total number of entities = nnn (10 in this case).

Step three: Comprehensive Computation of Statistics

Let's dissect the elements required to calculate the Pearson correlation coefficient:

- Scores (x) for Technology Capability: 85, 90, 75, 80, 88, 70, 82, 78, 92, 65.
- IPSAS Readiness Score y = 78, 85, 70, 74, 80, 68, 76, 72, 88, 60

Computational Table

Entity ID	Entity Name	Technology Capability (x)	IPSAS Readiness (y)	xy	x^2	y^2
1	GRA	85	78	6,630	7,225	6,084
2	MoF	90	85	7,650	8,100	7,225
3	VRA	75	70	5,250	5,625	4,900
4	GHS	80	74	5,920	6,400	5,476
5	GNPC	88	80	7,040	7,744	6,400
6	ECG	70	68	4,760	4,900	4,624
7	MoE	82	76	6,232	6,724	5,776
8	GPHA	78	72	5,616	6,084	5,184
9	BoG	92	88	8,096	8,464	7,744
10	GWCL	65	60	3,900	4,225	3,600

Computation Summation:

- $\sum x=805$\sum x = 805$\sum x=805$
- $\sum y=751$\sum y = 751$\sum y=751$
- $\sum xy=61,094$\sum xy = 61,094$\sum xy=61,094$
- $\sum x2=65,491$\sum x^2 = 65,491$\sum x2=65,491$
- $\sum y2=56,313$\sum y^2 = 56,313$\sum y2=56,313$

Correlation Outcome after substitution into the Pearson correlation formula:

Test Parameter	Value
Pearson Correlation Coefficient (r)	0.92
Degrees of Freedom (df)	8
p-Value	< 0.05
Significance Level	Significant

Step Four: Interpretation of Statistics, Interpretation of the 0.92-correlation coefficient:

1. Direction and Strength:

In the public sector of Ghana, there appears to be a substantial positive association between technical competency and IPSAS readiness, as indicated by the correlation coefficient of 0.92. There is a substantial tendency for IPSAS preparedness to increase in tandem with advances in technology.

2. Test of Significance:

i. Degrees of Freedom (df): n - 2 = 10 - 2 = 8n - 2 = 10 - 2 = 8n - 2 = 10 - 2 = 8.

For df = 8,

ii. The critical t-value is: There is statistically significant association between r=0.92r = 0.92r = 0.92 and df=8df = 8df=8, as indicated by the p-value of less than 0.05.

5. Conclusions:

 Statistical Significance: Ghana's public sector organizations possessing sophisticated technological infrastructures appear to be better equipped to execute IPSAS, as indicated by the strong correlation and statistical significance of the data.

 Practical Implication: In entities that are currently underequipped, efforts should be undertaken to upgrade their technical infrastructure in order to facilitate the successful deployment of IPSAS.

5.1 Further Findings And Discussion: Objective 1: Technological Readiness Levels

i. ERP Systems: To streamline procedures and combine financial data, a few Ghanaian public sector organizations have adopted ERP systems (Boateng & Acquah, 2016).

Cloud computing: As a cost-effective and scalable method for managing financial data, cloud-based solutions are becoming more and more popular (Osei & Mohammed, 2017).

Internet accessibility: Obtaining high-speed internet is still difficult in isolated places, which has an impact on the availability of financial data in real time.

ii. Integration Challenges:

Legacy Systems: A lot of public sector businesses continue to use outdated systems that don't work with IPSAS and other current accounting standards (Mensah & Lall, 2018).

compatibility Problems: The smooth integration of financial data across departments is hampered by a lack of compatibility across various systems.

iii. Cybersecurity Concerns:

Osei & Mohammed (2017) highlight that worries over data security and privacy are especially relevant in light of the growing use of cloud-based solutions and the possibility of cyberattacks. Technology adoption initiatives get more challenging when it comes to compliance: making sure that data protection laws and IPSAS rules are followed.

5.2 ANALYSIS OF RESULTS

i. Positive Results Uncovered

ERP Systems: According to Boateng and Acquah (2016), organizations that have used ERP systems have better reporting capabilities, increased data accuracy, and streamlined operations.

Smart Investments: To comply with changing accounting regulations and enhance financial management procedures, some companies have upgraded their IT infrastructure through smart investments.

ii. Difficulties Identified

Inadequate technological infrastructure: According to Osei and Mohammed (2017), there are major obstacles to utilizing sophisticated accounting technology, such as limited hardware and poor internet access.

Capacity Building: Staff members must receive ongoing training to improve their ability to use sophisticated accounting software and adhere to IPSAS regulations (Mensah & Lall, 2018).

Adopting IPSAS presents both potential and challenges when evaluating the public sector's current technology infrastructure in Ghana. Infrastructure, interoperability, and cybersecurity still have major gaps, despite some organizations making progress in using cloud computing and ERP systems. Enhancing Ghana's preparedness to accept and apply IPSAS successfully would depend on addressing these issues through strategic investments, capacity building, and improved cybersecurity measures.

5.3 Findings and Discussions on Objective 2: Evaluate Technology-Based Options forIPSAS Implementation: Examine particular technological solutions, such as blockchain, data analytics tools, cloud-based accounting software, and enterprise resource planning (ERP) systems, to see how well they support IPSAS compliance.

Technology-Based Options For IPSAS Implementation

i. Systems for Enterprise Resource Planning (ERP):

Integration and Centralization: According to Boateng and Acquah (2016), ERP systems have proven successful in integrating financial data amongst departments, enabling centralized reporting and adhering to IPSAS norms.

Process Streamlining: They improve efficiency and data integrity by streamlining the financial reporting, procurement, and budgeting processes (Mensah & Lall, 2018).

ii. Cloud-Based Accounting Software:

Accessibility and Scalability: Cloud-based solutions facilitate real-time reporting and decision-making by making financial data accessible from remote locations (Osei & Mohammed, 2017).

Cost-Effectiveness: They provide less expensive upfront investment and ongoing maintenance compared to conventional on-premise software.

iii. Data analytics tools:

Insight generation: public sector organizations can improve forecasting and strategic planning by using data analytics tools to extract actionable insights from financial data (Mensah & Lall, 2018).

Monitoring Compliance: By validating and analyzing data, they help to ensure that IPSAS requirements are being followed (Boateng & Acquah, 2016).

iv. Blockchain Technology:

Transparency and Auditability: Because blockchain maintains a decentralized database of financial transactions, it ensures data integrity and lowers the risk of fraud (Osei & Mohammed, 2017). Smart contracts have the potential to save administrative expenses and increase efficiency by enabling the automation of financial transactions and contract management.

5.4 Analysis Of Results

i. Technological Solutions' Efficacy

• ERP Systems: By facilitating centralized data management and uniform reporting, ERP systems' integration capabilities greatly aid in IPSAS compliance (Boateng & Acquah, 2016).

• Cloud-Based Solutions: These solutions provide scalability and flexibility, allowing public sector organizations to enhance operational efficiency and adjust to changing requirements (Osei & Mohammed, 2017).

• Data analytics: According to Mensah and Lall (2018), sophisticated analytics tools facilitate the use of financial data for strategic decision-making and the improvement of financial reporting transparency.

• Blockchain: Although still in its infancy, blockchain technology has the potential to improve financial transaction security and transparency while adhering to IPSAS guidelines (Osei & Mohammed, 2017).

ii. Challenges of Implementation

Technological Infrastructure: It might be difficult to successfully deploy cloud-based applications and data analytics tools in places with inadequate infrastructure, especially in rural areas (Osei & Mohammed, 2017). According to Mensah and Lall (2018), it is imperative that employees receive ongoing training and capacity building to guarantee they possess the requisite abilities for efficiently utilizing blockchain technology, analytics tools, and ERP systems.

There are numerous chances to improve IPSAS compliance in Ghana's public sector through technological solutions including blockchain, data analytics tools, ERP systems, and cloud-based accounting software. Ghana may take use of these technologies to increase financial accountability, efficiency, and transparency by tackling implementation issues through strategic infrastructure investments, capacity building, and pilot programs.

5.5 Findings and Discussions from Objective 3: Investigate Challenges and Barriers: List and evaluate the difficulties and impediments to using technology to promote the implementation of IPSAS in Ghana. These include human shortages, cybersecurity concerns, infrastructure problems, and opposition to change.

Challenges And Barriers To IPSAS Implementation

i. Limitations In Infrastructure:

Internet Connectivity: In rural regions, inadequate access to fast internet impedes real-time data processing and reporting (Osei & Mohammed, 2017).

Technological Equipment: The efficient application of cutting-edge accounting technology is hampered by the limited availability of current hardware and software (Boateng & Acquah, 2016).

ii. Cybersecurity Concerns:

Data Privacy: Privacy breach risks and data security concerns prevent organizations from fully embracing cloud-based solutions and other online platforms (Osei & Mohammed, 2017).

Complying with data protection laws and protecting against cyberattacks necessitates a large financial outlay as well as specialized knowledge (Mensah & Lall, 2018).

iii. Skills Shortages in the Staff:

According to Mensah and Lall (2018), there is a deficiency of trained staff members that are adept at utilizing blockchain technology, data analytics tools, and ERP systems to their maximum capacity.

Building Capacity: According to Boateng and Acquah (2016), ongoing training and professional development initiatives are critical to closing the skills gap and improving technology literacy.

iv. Resistance to Change:

Organizational Culture: Adopting new technology is significantly hampered by resistance from stakeholders used to traditional accounting processes (Osei & Mohammed, 2017).

Change Management: To overcome opposition and cultivate a culture that welcomes technological innovations, effective change management techniques are required (Boateng & Acquah, 2016).

5.6 Analysis Of Results

i. Effect on the Uptake of IPSAS

The adoption of cloud-based solutions and data analytics tools that are essential for IPSAS compliance is impeded by limited infrastructure and cybersecurity concerns, as noted by Osei and Mohammed (2017).

The absence of proficient staff who can efficiently employ cutting-edge technologies impedes attempts to update financial management procedures (Mensah & Lall, 2018).

Opposition to Change: The incorporation of ERP systems and other novel solutions is hampered by cultural opposition and an unwillingness to break from established methods (Boateng & Acquah, 2016).

ii. Overcoming Obstacles

Infrastructure Investment: It is recommended that government agencies and organizations give top priority to funding the development of technology infrastructure, which includes hardware upgrades and internet access.

Cybersecurity Measures: To reduce the risks of data breaches and guarantee data integrity, put in place strong cybersecurity policies and compliance frameworks.

Building Capacity: Create extensive training courses and skill-building projects to equip staff members with the know-how needed to embrace technology. Effectively handle resistance and foster a culture of innovation and continual improvement by implementing change management tactics.

For Ghana's public sector to embrace IPSAS and increase financial transparency, efficiency, and conformity with international standards, it is imperative to address the difficulties and obstacles involved. Ghana may successfully incorporate cutting-edge accounting technologies and accomplish sustainable development goals by making infrastructural investments, bolstering cybersecurity defenses, filling skill shortages, and controlling resistance to change.

6. RECOMMENDATIONS

1. Infrastructure Investment: To facilitate the adoption of IPSAS, government and public sector organizations should give top priority to investments in modernizing their technological infrastructure, including hardware improvements and internet access.

2. Training and Development: Put in place extensive training initiatives to improve the digital literacy and competencies of IT staff members and accounting specialists involved in financial management.

3. Cybersecurity Measures: To safeguard confidential financial information and guarantee adherence to data protection laws, bolster cybersecurity measures.

4. Compatibility Solutions: To enable smooth data integration and reporting, create plans to enhance compatibility between current systems and emerging technologies.

5. Integration Strategies: To improve data visibility and decision-making skills, public sector organizations should give top priority to connecting ERP systems with cloud-based solutions and data analytics tools.

6. Capacity Building: Make training program investments to develop staff members' abilities to use cutting-edge technology in an efficient manner while adhering to IPSAS guidelines.

7. Pilot Projects: To evaluate if blockchain technology can improve financial management's efficiency and transparency, conduct pilot projects.

8. Support from the government: Offer financial incentives and legislative measures to encourage cybersecurity and technology infrastructure improvements throughout public sector organizations.

9. Public-Private Partnerships: Encourage partnerships to bridge skill shortages and encourage the adoption of technology amongst government agencies, commercial technology companies, and academic institutions.

10. Training and Awareness: To enlighten stakeholders about the advantages of embracing technology and to cultivate a positive attitude toward change, hold training sessions and campaigns.

6.1 Statement of Data Availability

1. Data Accessibility: Upon reasonable request, the corresponding author will make the datasets created and/or examined during the current study on the role of technology in easing the adoption of International Public Sector Accounting Standards (IPSAS) in Ghana available.

2. Sources of Data:

The main information for this study came from surveys and interviews with Ghanaian accounting experts, technology suppliers, and stakeholders in public sector companies.

Supplementary information about IPSAS and technology adoption was gathered from official publications, reports that were available to the public, and scholarly works.

3. Accessibility of Data:

Raw Data: The unprocessed survey answers and interview transcripts are accessible in digital formats including text documents and CSV files.

Processed Data: Available in formats like Excel spreadsheets and SPSS files, aggregated data and analysis findings, including statistical outputs and thematic coding, are available.

Supplementary Materials: There are also other resources accessible, including coding frameworks, interview guides, and survey instruments.

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