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Effect Of Robotic Process Automation On Accounting And Finance Services In Nigerian Listed Firms: A Review Of Literature, An Innovation For Sustainable Economy

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Abstract: ***This paper discuses effect of robotic process automation accounting and finance services in Nigerian listed firms. The study was inspired by some number of existing literatures on this study area with respect to some misconceptions and mixed feelings surrounding industrial robots in accounting and finance field. These misapprehensions have accommodated ambivalence towards acceptance, adoption and implementations of robots in accounting and finance services among Nigerian listed firms. This study tries to review emerging issues neighboring these simultaneous conflicting reactions, beliefs and feeling towards this technological transformation of robotics with reference to Nigerian environment. The study bases its evidence on the empirical review from existing literature of various cases by several authors form both developed and developing economies in other to achieve the study objectives. This study discovers among others that: There is the need to address these ambivalence attitudes towards this paradigm shift from human labour operations to robotics labour force in accounting and finance services by giving it a holistic approach that it requires. Also there are innumerable antecedents benefits implanted with embracing industrial robots in accounting and finance field. Again, acceptance, adoption, and implementation of robotic process automation accounting and finance is still in its crawling stages among Nigerian listed firms.***

Keywords: Robotic, Automation, Rule-based, Accounting, Finance, Sustainability

I. INTRODUCTION

The need for robotic automation accounting and financial services become apparent as a result of persistent desire to have accounting and finance services system that can efficiently as well as sufficiently perform voluminous accounting and financial tasks in accounting and financial industry, in order to align with global accounting practices (Aslani, 2020; Kotarba 2018). Overtime, there have been attempts to improve on accounting and financial processes technologically which may be termed as revolution by many accounting theorists, just to ensure optimum measure of value creation in accounting and financing processes as a field.(Alfandi & Seckiner 2022). This paradigm shift from human to robots accounting and financial services are perceived as threat to human employment, hence some studies noted that Robotic Process Automation accounting and finance system have potentials to lower human employment opportunities while some perceived Robots accounting and finance as an era of competition between human and Robots, of course a set of scholar has a notion that robotic accounting and finance are structured to address some human workforce limitations, employees and customers' satisfaction. (Fernandez & Aman 2018; Jedrzejka 2019)

The initiation to robots accounting and finance can be traced back to 1960's as a Punched card system, as the first automated accounting system ever existed which input financial data into a machine, thereafter compute output reports. Automation accounting has now advanced and revolutionized accounting business. Hence, robots accounting has led to accounting transformation globally. The introduction of Robots accounting recently was in 2015 but

the acceptance was in 2018 (Chair, 2018, RPA, 2015, RPA 2018). At present, accountants use robots process automation accounting with steps and keystrokes which has transformed accounting workflows by the combination of disparate actions into a smooth automated process which captures users on screen actions through the use of scripts to carry out and accomplish repetitive, ruled-based accounting tasks. (Tajak, 2022) This paper examine perceived effect concepts and benefits of Robotic Process Automation accounting and financial services in Nigerian listed firms. Lekshmi (2020) described RPA accounting and finance system as automation software that performs difficult tasks by imitating human actions as regards to daily transactions processes, easier to operate, error free and more cost effective. Some authors perceived RPA accounting and finance as placing accounting tasks and finance in the hand of robots by human supervision. While other studies viewed robotic accounting and finance as technology which could substitute accountants in the accounting field (Egiyi& Chukwuani 2021; McCallion & McMullan, 2015; Gray, 2018)

Robotic process automation accounting and finance is described as an automation accounting and financing system whose workflow is rule- based, repetitive, highly scalable ,voluminous, stable, error free, digital data generating, which involve many transactional processes such as involving, data gathering accounting, tax, intercompany reconciliations, inventory management, pay roll managements, fraud detection, customers notifications, credit card processing, financial reporting, purchases order full cycle accounts .This study adopts Robotic Process automation (RPA as independent variable while accounting and financial services (AFSs) is adopted as dependent variable. The study measures RPA as: Highly rule-based, Highly repetitive, Highly automated, Digitalized structured data, High volume of tasks, Proper documentation, Fewer complex processes, Highly interactive with many systems, Costs reduction, Availability, Highly speedy, and accuracy Human attributes, Transactional, standardized, tireless services ,Regulatory compliance, Data governance. While accounting and finance activities can be measured as: Tracking daily transactions, Standards and compliance for routine tasks, predictive analytics, Financial reporting , decision support, General estimation and financial control, Firms reputation, growth and expansion, Financial hedging, Maintenance costs, Taxation etc.

THE STUDY OBJECTIVES

The broad objective is to examine effect of robotic process automation on accounting and finance services. While specific objective are:

- ✓ To ascertain different empirical views regarding industrial robot accounting and finance services in listed Nigerian firms
- ✓ To use some case studies that can draw clearer perception on robotic process automation accounting and finance services in Nigerian environment
- ✓ To educate firms and individual accounting professional on the potential effect and benefits of industrial robot automation accounting and finance services in Nigerian environment

Accounting and finance services practices in Nigerian firms are yet to experience transformational trend of the new wave in the global digital accounting and finance services alongside with robotic technologies like other neighboring countries (Tajak, 2022; Deloitte's RPA survey 2015). Also Nigerian listed firms are yet to unveil antecedents benefits and capabilities accrued to robotic accounting and finance which was structured to address accounting and finance issues in order to harness customers' needs, employees satisfaction and as well increase competitive advantage associated with robotic accounting and finance, probably as a result of the perceived threat and panic already exists on robots taking over the workforce in the accounting and finance world. (Blair, 2023; Gray, 2022). Many tasks that relate to accounting and finance services have been in the hands of human instead of automating between 14% - 43% to robot due to lack of appropriate approach and transformational methods as well as Nigerian firms uneasiness about placing essential tasks in the hands of robots, without making sufficient research on the prospects and issues that bothers on robotic accounting and finance technologies (Higgins, 2021; Blair, 2023; Leduc & Zheng, 2020). These and other related issues arouse the researchers' interest on this topic.

II. LITERATURE REVIEW

A. CONCEPT, MEASUREMENT AND EFFECT OF ROBOTIC ACCOUNTING AND FINANCE SERVICES

This segment of this study is structured to highlight and review concepts, perceived benefits and effect of robotic accounting related literature of various in-depth studies, carried out by some scholars on Robotic Process Automation Accounting and Finance Services. There have been different views from different authors on the concept of robotic technological accounting and, finance services, for instance Embracing robotic (2018) viewed robotic accounting as an invention of accounting program- robots which can be structured to perform repetitive, rule-based, high-volume tasks by automating some human actions when accessing multiple applications and documentations. Cheng, Lyandres, Zhou and Zhou (2022), noted that firms with relatively high labour contribution and low capital contribution as well as firms with production functions in which robots and workforce are highly substitutable as those are the firms for which hedging with robots is effective. Firms with adjustments costs associated with robots' deployment, in which implementing the operational financial hedging is not prohibitively costly, adding that financial hedging mechanism depends on two factors; robots and labour, which are substitutable, inputs in firms' production function. Thus the uncertainty in depreciation costs of physical capital including robots is lower than the uncertainty in labour costs in their theoretical and empirical review. (Leduc & Liu, 2020; Guerreiro, Rebelo & Teles, 2020)

Alfandi and Seckiner (2022) affirmed that financial services are shifting towards a more systematic utilization of technology to decrease costs and maintain high consumer loyalty. Empirical and theoretical review findings established

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that Robotic Process Automation significantly and positively affect Banking industries. (Sibanda, W, Ndiweni, E, & Boulkeroua, M, 2020). Fijabi and Lasisi (2023), noted that robotic process accounting has greater potentials to improve accounting and finance practices which has brought relief to those areas where human labour forces appear to be cumbersome, for instance: invoicing, billing, reconciliations of accounting etc. Deloitte.com (2023) stated that to maximize fully the advantage of financial automation that has potentials to create efficiency and free up resources. Firms should ensure to consider robotic process automation which has relief human labour forces or relatively tedious accounting and finance processes in order to devote more time on other accounting and finance issues which are more professional. This is perceived as great relief since a greater percentage of processes are deployed to robots depending on the nature of the firm. Some firms may decide to deploy every other accounting and finance processes except analysis and decision making, since a greater percentage of sensitive accounting processes are expected to be handle by human labour force while lesser sensitive ones are deployed to robots. This also grants professional accountants and financial analysts more opportunity to concentrate professionally. (Bhargava et al etal.2020). Xun (2021) noted that financial robots have the capabilities to automatically perform basic financial processes in affirm, enhance reliability of information, analyze the difference between accounting records and tax receipts from data sources as well as improved businesses. Tajak (2022) observed that 53% of organizations had adopted robotic automation process accounting as at 2018 and larger firms is anticipated to be in the process of adopting RPA accounting by 2024. Moreover despite the widespread adoption of RPA accounting, less than one- third of adopters utilize the technology for accounting and financial reporting. (Deloitte, RPA Survey, 2015; Deloitte 2016, Deloitte 2020; Deloitte, 2023). In same vein, Reshaping the future, (2018) noted that the absorption rate of RPA accounting is gradually going up to 72% of the organizations surveyed are considering implementation process. Again, over 60% of firms across several industrial sectors that are already deployed RPA, tend to adopt rule-based automation which appears to be superior among others (Robotic Process Automation, 2019).

PwC (2017), projected robot labour force deployment of work activities that can be automated at 45%, which could save about $ 2 trillion in global workforce costs yearly, firms that are still far from maximizing these opportunities provided by automation as the capabilities of this accounting technology appears to improve businesses in a rapidly manner. Therefore firms should consider adoption of robotic process of accounting. Wang, Yongqin, and Wen- Dong. (2020) opined that robotic process automation house huge potentials for financial accounting as well as offers potentials capable of transforming accounting world. Fernandez and Aman (2018) researched on the impact of robotic process automation on global accounting services (GAS) using institutional logic lens and found that there is significant impact on the individual and organizations who embraced, adopt and implement industrial robots, which could result to changes in operations as well as reduction in human workload thereby reducing number of employees, thus creating room for competition between robots and human labour workforces. Aslani, (2020), establishes that automation accounting has affected multiple workflows within the office as well as many tasks that relate to finances in the recent time (AAA, 2019; ACC. & CA ANZ Reports, 2017; Akpata, 2019; PWC's Report, 2018).

Vardia, Soni, and Saluja (2020), investigated Awareness about emerging trends of Robotic in accounting on empirical research and discovered that Robotic process automation accounting has effect on accounting processes and profession significantly. In same vein, Januszewskwi, Kujawski and Buchalska-Sugjska (2021), researched on Benefits of and obstacles to RPA Implementations in accounting firms to determine the extent of implementation and found out that relatively few accounting firms have fully implemented RPA accounting. Kokina, and Blanchette (2019), conducted research on early evidence of digital labour in accounting: Innovation with robotic process automation drawing upon two theories such as : Theory of Task-Technology Fit (TTC) and Technology-to-performance Chain (TPC), using analysis data from adopters of RPA and document task suitability, task-technology fit, implementation issues and resulting performance outcomes, results indicated that: securing capability is only a part of RPA implementation process, organizations engage in standardization and optimization of process ,develop scorecard-like tools to rank tasks, adjust governance structures to include digital employees, and redefine internal controls also organizations benefit from automating only certain processes, those that are structured, repeated, rules-based, with digital inputs, as well as costs savings, improved process documentations, lower error rate, more accurate measurement of processes performance, and better reporting quality.

Some scholars have dealt on effect of robotic accounting and finance services in firms but had differences in methodologies, scope, locations and findings, hence they generated mixed findings which gave room for different perspectives of effect on RPAAFs. Some researchers perceived RPAAFs as a traitor to human labour, some as a relief to human workforce, and some as a competitor to human labour forces, increase in employees and government satisfactions, and some employees express fears as regards to their believe about replacing them with industrial robots and others opined that human labour may impede growth in accounting industry. (Tschakert et al, 2016) which have resulted to number of mixed feeling on the widely acceptance of RPAAFs for adoption and implementations. Furthermore, Most case studies used were relatively limited in scope, a number of them adopted qualitative approach, while relatively few applied quantitative approach. In terms of effect, benefits, attitudes and costs in their studies. Also some studies noted that robotic process automated accounting and finance have potentials to reduce human labour to some percentage level of employees for instance, insurance and accounting were estimated to be 43% (Nedelkoska, & Quintini, 2018), 40% as in Axson, 2015, 61% for human labour force and 39% deployment for robots. As stated by Drum and, Pulvermacher, (2016) 18%, as opined by Reshaping the future, 2018, which is relative or peculiar to different industrial sectors that are yet to be established globally.(;The future of Jobs, 2018; Spencer, 2018; The Robots are Ready 2018), (Blair, 2023) found that

only 14% of human labour force were replaced. Furthermore, cases cited by a number of authors on this study area appear to be limited in scope, regional and in findings, which this study desire to address to some extent.

B. POTENTIAL BENEFITS OF INDUSTRIAL ROBOTS ON ACCOUNTING AND FINANCE SERVICES

Review or related studies on robotic process accounting and finance services has led to discoveries of undeniable potential benefits amass to RPAAFs overtime, which can be identified as follows:

- ✓ Predictive analytics: Industrial robots implementation has the potential benefit of Predictive analytics in accounting and finance industry, which is the use of accounting data to predict future trends and accounting event outcomes like: Customers churn or attrition, (The number of paying customers who fail to become repeat customers, this is the percentage of customers who stopped patronizing firms products), credit and loan defaults, Firms' exposures to sudden price fluctuations on goods and services as well as share prices with some variables that enhance your decisions (Daniel 2022)
- ✓ Financial reporting: Potential benefit amasses by use of financial reporting robots in firms. This can be achieved by automating processes across regulatory reporting capabilities and improved efficiency. (Accenture, 2017)
- ✓ Decision support: When robots take over human labour force, data form a scanned invoice to fully automatic booking of the invoice without human intervention. Robotic tasks processes are ruled-based, repetitive which is credible regarding implementations. Accounting and finance services are rule-based repetitive discipline except in the aspect of decision making. But RPA can support accounting and finance decisions
- ✓ Cost reduction: Robotic process automation accounting and finance have the potentials in reduction of costs in the aspect of cost of employees' salaries allowances, welfares retirements, overtime and bonuses, as well as tax payments , unlike human labour forces
- ✓ Tireless and always available: One of the potential benefits of industrial robot automation accounting and finance services is the unique qualities of tirelessness and availability of industrial automated robots in the area of function and productive hours unlike human labour, where there is leverage for break time, and official annual leave for employees of firms. Thus, there is reduction in operating costs
- ✓ Performance Accuracy and Higher Productivity: The invention of Robotic process accounting software for end-to-end processing has the capability to perform accurately and spend little time for greater outputs in workflows and in employees satisfactions thereby saving more time for analytics and decision making (ElectroNeek, 2021; Chair 2017). Industrial automated robotics can also increase data accuracy (Bhargava et al. 2020). Human errors tend to be drastically reduced. Okeke, (2022), asserted that RPA enables banks to increase their productivity by engaging customers in real-time and achieving operational efficiency via robots workflows
- ✓ Account Reconciliations, General Ledger, Sub Ledgers Closing, Journal entries Validation, Low-risk Accounts Consolidation etc. Automated accounting robots have potentials to undertake these tasks effectively and efficiently unlike human labour force.
- ✓ Reporting on; Monthly, Quarterly close, internal performance and management reporting, aggregating and analyzing, external statutory and regulatory reports. These and other related tasks are potentially handled by RPAAFs.
- ✓ Financial Hedging: Industrial Automated robots are very useful in financial hedging since they have the capability to access and track more information than human analysts that give them edge to predict and measure when to take a position in both long and short terms investments such as foreign exchange hedge (Bajinea,2021)
- ✓ Greater Customer Care and Satisfaction: Industrial Robotic Automation has the capability to interact with Chabot which is capable of delivering personalized experience on behalf of customers in real time, thereby increasing customers and employees' satisfactions
- ✓ Payroll Maintenance Costs: Robots accounting automation assist in payroll preparation tasks via onboarding process support. Salary calculations of employees through employee data maintenance, salary increases via compensation and benefit administration, accounting data generation, reconciliation and reporting through vacation and absence notification, Automate the transfer of employee master data into the pay roll system and note the successful transfer of the each file. These as yielded flawless payroll with the help of a software robot increase accuracy, timeliness and compliance.
- ✓ Tax Accounting: RPA accounting computes and reports tax elements to tax authorities after salary calculation and payments.
- ✓ Cash management, general ledger accounting for ,inter-company transactions , inventory accounting, travelling expenses reimbursement and reimbursement request and documentations , expenses reports
- ✓ Fixed Assets accounting: Robots accounting and finance units make mundane tasks related to fixed assets management faster, easier, efficient, and relatively more accurate , compare to human employees
- ✓ Scalability and compatibility: Scalability of RPA implies; accounting and finance robots work flexibly together in undertaking many businesses processes at different times via support for large number capability
- ✓ Relatively Standardized Processes: RPA accounting and finance expedites process standardization capability.
- ✓ Improved Compliance access key business: Industrial robots has the potential to improve many area of compliance in accounting and fiancé services
- ✓ Credit Card Processing: RPA accounting and finance, have the capability to maximize its rule based potential in processing credit cards applications, approvals and implementations
- ✓ Expenses Processing: There are potential in RPAAFs in tracking firms' expenses automatically without stress.

- ✓ Financial Budgeting and Analysis: Industrial robots tend to make financial budgeting easier, accurate and better for informed decisions via budget software models.
- ✓ Loan Processing: RPAAFs also has potential to expedite lending processes in banks with little or no itches attached
- ✓ Anti-Money Laundering and Know your customers (KYC): RPAAFs has the potentials in detecting suspicious banking transactions
- ✓ Business data Security: Industrial robots have the capability for data encryptions, security attacks, such as phishing, man-in-the-middle or cracking, general data protections via security control. Human are not exposed to have access to sensitive data
- ✓ Mortgage Lending::RPA accounting and finance appear to have addressed the highly –process driven of mortgage lending in the field of banking and finance
- ✓ RPA Accounting has the capability to Automate invoices, Receivables and Payables Automation, and Financial Statements Preparations

C. THEORETICAL REVIEW

There are many theories that can explain and support Effect of robotic process automation accounting and finance services (RPAAFs) in listed Nigerian firms. This include: Theory of Task-technology fit (TTF), Technology-to-performance chain (TPC) and The Institutional logic of Digitalization (T ILD).

The theory of Task-Technology Fit (TTF). This theory of TTF was propounded by Googhue and Thompson in 1995, to explain the utilization of technology to intended users on the anticipated tasks' requirements in other words; it advocates a means of quantifying the effectiveness of technology in a structured system, by assessing the relationship between the robotics and the tasks the technology aims to support (Spies, Grobbelaar, & Botha). The aim of TTF theory was to add to the body of knowledge on technology implementation as well as usage of various technologies in a system. This theory appears to be widely recognized and often use to justify the application of technology in a system especially in the aspect of literature. Therefore, this theory relates to robotic process automated accounting and finance services in the Nigerian listed firms. This study therefore is hinge on TTF theory since it appears to have better theoretical disposition which explains and supports RPAAFs in aspect and extent to which robotic processes automation add value to organizational systems when the system eventually harness the organizations' tasks and the proposed accounting and finance technologies which is usually structured alongside with the organizations' business activities (Systems' processes). This compatibility would determine the effect on the performance and how robotic process automation system would be improve accounting and finance services. Mamudu and Lamido (2017), noted that industrial robots adoption and implementation poses potentially as a new highly paying jobs.

D. INSTITUTIONAL LOGIC OF DIGITALIZATION THEORY (ILDT)

The institutional logic of digitalization is a theory propounded by Schildt in 2022. It captures several clear values and evaluation criteria that are shared globally and span both the experts' practices and managerial beliefs. (Schildt 2022) The institutional logic of digitalization is a theory that represents organizations' reliance on effect of technology automation- based in data and algorithms over human expertise and work which could be describe as "conceived digitalization transformations' practices in firms, which assists to explore on the perceived existing relationship between the acceptance of digitalization values and complex changes on processes and firms as trends of innovations in accounting automation adoption. Also, there has been conventional belief which relates explicitly to organizing such as the normative value attributed to team-based structure that is expected to mirror technological architecture (Kronblad, 2020, Murray, Rhymer & Sirmon, 2021) The above logic perspective can help understand levels of efforts made by firms to leverage digitalization practices as well as transformations. This theory is no doubt relates to robotic process automated accounting and finance practices which are capable of transforming firms from human- based labour to robotic-based workflows, as firms adopt and adapt to this new invented accounting and finance technologies in this present day.

E. THEORY OF TECHNOLOGY-TO-PERFORMANCE (TPC)

The theory of technology-to-performance chain was invented in 1995 by Goodhue and Thompson. This theory tends to draw insights from research on user attitudes as prognosticator of utilization and perception from a research on task-technology fit as a prediction of performance practically. This theory was tested in two positions which include: Voluntary usage and mandatory usage. Between the two scenarios, strong support indicated to be more effective technologically fit on performance, attitudes and beliefs in terms of usage. Also a social norm was found to be significantly impactful on utilization in the position of mandatory scenario. TPC theory quite relates to robotic process automation accounting and finance in the aspect of prosed automation adoption and implementation in organizations as transformational trend in the field of accounting and finance services.

III. METHODOLOGY

The basic approach as regards to this study on this topic is to highlight on the incremental value creation and relevance of robotic accounting and finance. This study adopts empirical review to examine effect of industrial robots on accounting and finance services. The justification of adopting this qualitative method is to review individuals and firms perspectives on effect of accepting, adopting and implementing robotics in accounting and finances services in Nigerian listed firms. Therefore, this approach is chosen in

order to have a clearer and true representation of RPAAFs and capabilities as well as potentials in order to achieve stated objectives in the study. Review of robotic automated accounting and finance services as a holistic revolutionary transformation which is characterized by changes in approaches and methods in the field of accounting and finance has displayed sufficient evidence of paradigm shift from accounting machine tools automation to robots rule-based, repetitive and compliance tasks era, which deploys robots for certain percentage of labour force to robots and other percentages of labour force to human. To achieve the first objective, the study capture some related empirical views on effect of industrial robots on accounting and financial services by different authors form developed and developing economies. As a means to achieve the second objective, this study cited some case studies in order to generate sufficient evidence and conviction as regards to the capabilities of RPA in accounting and finance services .With the aim of achieving the third objective, this study captured related benefits of RPA in accounting and financial related services in other to educate and valeted RPA accounting and finance services awareness.in Nigerian environment. (Cheng, et al2019b; Cheng et al 2019a)

IV. CONCLUSION AND IMPLICATIONS

Deployments of robotics automation in accounting and financial services have recently gain popularity and serious attentions in accounting, business and finance research, which may be consider as worthwhile and effective system for quality reporting in listed Nigerian firms as new accounting technological practices, (Fijabi & Lasisii, 2023; Atoyebi, 2020) RPA is proved to has been driving greater efficiency and proactive compliance, accuracy services in recent time. In same vein, robotic accounting and finance have enabled firms have better technological options than human labour force which have benefited group of persons and firms as unique experience. (Swisslinx, 2022). There has been a serious debate as regard to potion or human labour currently believed to be deployed to robotics in the field of accounting and finance. Some scholars advocate for robots rights on a par with human beings while some scholars appear to be in dispute with the fact that robots are not worthy of rights in Nigerian environment (Ake, 2021). Another school of taught noted that the robotics tend to create newly and highly-paid jobs that demands skills acquisition, replacing low-skill labour force and obviously sensitive as well as quality related jobs are believed should be assign to human labour force (Mamudu & Lamido). While other studies opine that industrial robots accounting and finance technology has been invented to replace the entire human labour force, in the light of the above impressions, employees in accounting industry, appear not to perceive robotic automation as paradigm shift to the association between accountants and robotics accounting technology but as disruptive transformative technology, as well as threat to accountancy jobs On this ground, effect of industrial robotics in accounting and finance services are still in its uncertainty stage in Nigerian environment. To experience relative full effect of robotics in accounting industry, this study advocates for intensive seminars, lectures, teachings and holistic orientations, as well as general research on robotics automation accounting and finance services, in order to acquire sufficient knowledge and the right impression hence correcting all misconceptions on the robotics accounting and finance services in this field of study.

Thus existing literature in this study area have indicated that robotic automation in accounting and finance is still in its crawling stages in Nigerian environment.

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