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Nexus between process automation and corruption on the Nigerian Agricultural Programs

MASTER'S THESIS

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I have written this master's thesis independently. All viewpoints of other authors, literary sources and data from elsewhere used for writing this paper have been referenced.

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Abstract

This Master's Thesis investigates the complex relationship between automation and corruption in the Nigerian agricultural sector, with a focus on the agricultural programs since Nigeria gained her Independence.

Automation has been widely recognized as a powerful tool to enhance transparency, reduce opportunities for bribery, and increase accountability, which can ultimately lead to a reduction in corruption.

The study employs the qualitative research design approach, by conducting in-depth interviews with stakeholders in the Nigerian agricultural sector. The research evaluates the current state of automation in the Nigerian agricultural sector and its impact on corruption, while also identifying areas that require further development to maximize the potential benefits of automated systems.

The findings reveal that automation can indeed contribute to the reduction of corruption by streamlining processes, minimizing human intervention, and generating detailed records for auditing purposes and also, instilling socio-cultural values within the public system. The implementation of e-governance platforms and other digital tools has led to increased transparency, enabling citizens to monitor government projects and services more effectively.

Chapter 1: Introduction

This research work analyses the nexus between automation of process and corruption in the agricultural sector in Nigeria.

The Nigerian agricultural sector is historically plagued with misappropriation of human and material resources with as many as ten unsuccessful agricultural programs, counting from the 1960 Nigerian independence (Elijah, 2019). A huge monetary estimation is annually credited as waste of resources in Nigeria that are traceable to misuse and misappropriation of resources (Ashforth & Anand, 2003; Reyes, 2018). There are so many indicators that are being used to capture and measure corruption, but most of them do not consider the stereotypic story behind each society where the data is collected. This concept of illegal use of or misappropriation of resources is described as systemic corruption (Reyes, 2018).

The subject of interest was the Nigerian agricultural sector, especially government programs that were targeted at improving quality and quantity of food and other agricultural produce. This was important because the sector possesses both forward and backward linkages to other sectors of the economy. This makes it possible to receive funding support from sectors such as finance and oil, but also provides raw materials for manufacturing and funding for education, to mention but a few. Also, agriculture has been estimated to employ close to 70% of the labour in Nigeria, on the average (Eurofound, 2018). Agriculture provides food, expands foreign exchange earnings, provides employment and reduces crime, contributes significantly to national income, and serves to preserve the environment's value, among other benefits. In credit to the theory of unbalance growth (TUG) (Singer et al., n.d.), countries are advised to focus on sectors that have the highest linkages to other sectors to speed up developmental processes. This was why agriculture was the focus of this research.

The concept of automation according to the International Society of Automation is described as the creation and application of technology to monitor and control the production and delivery of products and services (*What Is Automation?* n.d.).

Corruption on the other hand, simply means the abuse of entrusted power for private gain (*What Is Corruption?* n.d.).

1.1 Research Objectives

The research objective is to provide insights into the relationship between process automation and corruption in Nigerian agricultural programs and the paper aims to answer the following questions;

1. How does corruption affect the Nigerian agricultural programs?
2. What is the relationship between process automation and corruption in the Nigerian Agricultural Sector?

This study becomes an important issue because Nigeria is the largest economy in Africa as of 2022 (Anele, 2022) and also, has the 4th largest agricultural land area in Africa to total land area at 75.9% and, ironically, one of the lowest farm output-land ratio, at 23.4% (Statista, 2021).

The pursuit of process automation becomes essential in order to electronically supervise the process flow in order to ensure transparency of the process in reducing corruption.

Keywords: Process Automation, Corruption, Nexus.

Research classification codes (CERCS): S187 – Agricultural Economics, S189 Organizational science

Chapter 2: LITERATURE REVIEW

2.1 An Overview of the Nigerian Agricultural Sector

It is said that the Nigerian economy faced a significant setback when crude oil was discovered in 1970. (Oumarou, 2022; Statista, 2022). Prior to the discovery of crude oil at Oloibiri, Delta State of Nigeria, agriculture was the main source of revenue, as it generated about 90% of total gross domestic product of the country (Statista, 2021, 2022). The agenda to industrialise Nigeria was hinged on agriculture and technology immediately after independence in 1960, the first National Development Plan was drawn (InfoGuide Nigeria, 2015). So, the manufacturing sector was to be strengthened by making sure that locally sought raw materials and technologies were used and parts for the machines were bought with the import substitution trade policy (InfoGuide Nigeria, 2015; Oluwafemi et al., 2021).

The Nigerian agricultural sector was largely human-driven and automation was limited and costly at the time. This was because, against the decision established in the National Development Plan of 1962/63, the industry was mostly extractive which includes sending raw materials like cocoa, rubber, fish, cassava, kolanut, groundnut, yam and several others abroad in exchange for foreign technologies for which indigenous skilled labour had not been trained and certified. Also, support for maintenance was at a high cost. So, processing of raw materials into finished products took place abroad and foreign reserves were spent to buy finished products as more and more demand for them grew locally.

Every other National Development Plan that had been created to bridge the gap in the provision and implementation of the first ones was designed to achieve agricultural autonomy; a concept that required that, from start to finish, all agricultural processes must start and finish in Nigeria. This was aimed at ensuring increased food production and increased exportation of finished products. However, the administrative system lacked proper accountability and oversight that could take care of sabotages. These sabotages started reflecting in the failures of not less than ten agricultural programs or schemes, which were designed to foster the policy agenda

2.2 An Array of agricultural schemes in Nigeria from independence and the Failure Drivers

The table below shows an array of most of the agricultural programs the Nigerian government designed or subscribed to between 1960 and 2023. This was because the 1986 Structural Adjustment Program was a World Bank and International Monetary Fund (IMF) initiative fully designed and proposed by the two organisations. Majority of the programs were conceived, designed, implemented and monitored by the Nigerian government over the said period. Therefore, the success or failure of these programs can be traced to the activities of the Nigerian government to a larger extent.

Table 1 List of agricultural programs or schemes in Nigeria since 1960 and their Failure Drivers.

Date	Programs	Objectives	Reason Failure
1960 - 1966	Regional Agricultural Programmes (RAP)	To improve food security, promote rural development, regional co-operation and gender equality agriculture by ensuring that women had equal access to resources, technologies, and services in agriculture.	More on cash crops and almost nothing on food crops.
1966 - 1975	National Accelerated Food Production Programme (NAFPP)	Increase food production through the adoption of modern agricultural practices and improved seed varieties.	Farmers who could not form cooperatives were left out. The programme relied on disbursement of credits and farm inputs through cooperative societies in which most small-scale farmers did not benefit.
1976 – 1977	The River Basin Development Authorities (RBDAs)	Manage water resources and promote agricultural development in Nigeria's river basins.	Intensive political interference and substantial public funds were wasted to streamline sizes and functions.
1974 – 1982	Agricultural Development	Improve agricultural extension services, promote modern farming techniques, and provide credit to	Looted funds, Unskilled Labour, Substandard

	Projects (ADP)	smallholder farmers	Equipment
1976 – 1979	Operation Feed the Nation (OFN)	Increase local food production, reduce dependence on food imports, and encourage self-reliance in agriculture	Indiscriminate use of land, Inexperienced farmer; low diseases control capacity
1979 - 1983	The Green Revolution Programme (GRP)	modernizing agriculture by promoting the use of high-yielding seed varieties, agrochemicals, and irrigation infrastructure	Poor execution, poor monitoring; poor funds misappropriation
1983 - 1985	Back to Land (BL)	To become self-sufficient in food production, create employment opportunities and diversify the economy.	Inadequacy of data, Insufficient input and technological deficiencies
1985 – 1993	Directorate for Food, Roads and Rural Infrastructure (DFRRI)	To promote rural infrastructure development, poverty reduction and to create employment	poor quality of infrastructures; embezzlement/mismanagement of fund, improper focus and programme accountability
1986	Structural Adjustment Programme (SAP)	To promote economic liberalisation, fiscal discipline and economic stabilisation	Mismanagement of fund and corruption
1990s	National Fadama Development Project (NFDP)	To provide farmers with access to land, credit, extension services, and marketing support. Promote community-based decision-making and ensuring the active participation	Highly placed officers usurped land that belonged to poor people
1992	National Agricultural Land Development Authority (NALDA)	To promote land development, youth empowerment and food security	unskilled handlings of water application through irrigation degrade and deplete the soil of its productive capacity
1999 – 2007	National Economic	To reduce poverty and promote economic growth through various initiatives, including agricultural	Corruption, mismanagement, lack of

	Empowerment and Development Strategy (NEEDS)	development (National Planning Commission, 2004)	accountability and proper planning
2003	Root and Tuber Expansion Programme (RTEP)	To increase agricultural productivity, to promote rural development and to provide food security.	Problem of market, lack of accountability, and proper planning
2010 - 2015	Agricultural Transformation Agenda (ATA)	To transform Nigeria's agricultural sector by increasing productivity, promoting value addition, and improving market access for farmers. -To improve food security in Nigeria by increasing agricultural productivity,	Corruption, embezzlement of funds, lack of transparency, Islamic insurgency, herdsmen and farmers conflicts, lack of planning, monitoring and evaluation
2015-2023	Growth Enhancement Support Scheme (GESS) under ATA	-aimed to increase agricultural productivity in Nigeria - to reform Nigeria's agricultural input subsidy system by introducing an electronic voucher system that would enable farmers to access subsidized inputs such as fertilizers and seeds directly from private sector suppliers.	Lack of focus and distraction from corruption

Source: Elijah, (2019); and Oluwafemi et al., (2021)

Table 1 above shows a tabulation of some of the major and dominant agricultural schemes designed and implemented by the Nigeria government through the Ministry of Agriculture and Rural Development (MARD) to drive profitability and other items on the agenda enshrined in the National Development Plan for the agroindustry. In the findings of Elijah, (2019); and Oluwafemi et al., (2021) and as summarised on the table above, all of these programmes failed majorly because of one form of corruption or the other and this is evident from the fact that new schemes are developed year after year to address previously set goals and objectives. Corruption goes beyond just being venal with money, financial assets or other non-financial assets. It begins when an idea is improperly conceived, resources are misappropriated, incapable and unqualified personnel are

engaged on nepotism, projects are porously monitored at implementation and the fraudulent gains therefrom are perceived as smart rewards ideologically (Ashforth & Anand, 2003; Liu, 2016; Oluwafemi et al., 2021; Oumarou, 2022).

The Nigerian agroindustry has been experiencing drainages and leakages as a result of obvious reasons for which these previous programmes failed (Balogun et al., 2015; Godson-Ibeji et al., 2016; Mile et al., 2021). In the works of Mile et al., (2021), government spending on agriculture is highly significant to the size and quality of agricultural output. So, if there was any fund misappropriation or embezzlement, there will be a major downward swing in the quality and quantity of output from agriculture (Mile et al., 2021). This has made it imperative to access where Nigeria stands in perceiving, understanding, acknowledging, and combating agricultural corruption.

Elijah, (2019); and Oluwafemi et al., (2021) both agreed that the Nigerian agricultural sector has its peculiar hindrance. They pointed out that the situation is quite different from other countries of the world, even in Africa. Mile et al., (2021) supported the fact that projects can actually be executed in the presence of any or all of these militating factors, but their effects only become clear in the long run. So, just as government spending shock, increase or decrease, has positive relationship with agricultural output in the future, so will misappropriation of funds, lands and other resources create a deep in quality and quantity of same output (Elijah, 2019; Faull, 2007; Mile et al., 2021).

Table 1 Qualitative Review of the Nigerian Agro-economy Failure Drivers

Date	Programs	Failure Drivers		
1960 1966	– Regional Agricultural Programmes (RAP)	External Interference	Misplaced Priority	Poor Technical Knowhow
1966 1975	– National Accelerated Food Production Programme (NAFPP)	Disenfranchisement	Poor Monitoring	Poor Technical Knowhow
1976 1977	– The River Basin Development Authorities (RBDAs)	Political Interference	Funds Misappropriation	Poor Technical Knowhow
1974 1982	– Agricultural Development Projects (ADP)	Embezzlement	Employment Nepotism	Poor Technical Knowhow
1976 1979	– Operation Feed the Nation (OFN)	Land Misappropriation	Employment Nepotism	Poor Management

1979	–	The Green Revolution Programme (GRP)	Poor execution	Poor Monitoring	Poor Technical Knowhow
1983	–	Back to Land (BL)	Poor Management	Technical Knowhow	Poor Technical Knowhow
1985	–	Directorate for Food, Roads and Rural Infrastructure (DFRRI)	Embezzlement	Misplaced Priority	No Accountability
1986	–	Structural Adjustment Programme (SAP)	Fund misappropriation	Poor Technical Knowhow	Embezzlement
1990s	–	National Fadama Development Project (NFDP)	Land Misappropriation	Poor Technical Knowhow	Embezzlement
1992	–	National Agricultural Land Development Authority (NALDA)	Poor Management	Poor Technical Knowhow	Embezzlement
1999	–	National Economic Empowerment and Development Strategy (NEEDS)	Poor Design	Fund Misappropriation	Poor Technical Knowhow
2003	–	Root and Tuber Expansion Programme (RTEP)	Poor Design	No Accountability	Poor Technical Knowhow
2007	–	Seven-Point Agenda. (SPA)	Poor Management	Poor Design	
2010	–	Agricultural Transformation Agenda (ATA)	Embezzlement	Insecurity	Poor Design
2015	–	Growth Enhancement Support Scheme (GESS) under ATA	Misplaced priority	Poor Technical Knowhow	Embezzlement

Source: Elijah, (2019); and Oluwafemi et al., (2021)

Table 2 above shows pinpointed reasons that led to the failure of each and all the agricultural programmes the Nigerian government had implemented up until year 2022. The last programme is still running but with little or no effect. This is because all economic indicators point to the fact that food consumer price index has been the highest within the period of implementing the program. This qualitative review agrees with the conceptual review created earlier in this literature review section to define corruption in relations to the Nigeria situation.

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and other resources create a deep in quality and quantity of same output (Elijah, 2019; Faull, 2007; Mile et al., 2021).

2.3 Corruption and the Nigerian Agricultural Sector

Corruption is a complex and pervasive phenomenon, typically defined as the abuse of entrusted power for private gain (Transparency International, 2021). The Nigerian agricultural sector, a critical component of the national economy and a significant source of employment, has not been immune to the consequences of corruption.

Several studies have documented the prevalence of corruption in Nigeria's agricultural sector and its impact on various programs and initiatives (Ayoola, 2001; Ogbeidi, 2012). For example, corruption has been found to undermine the effectiveness of agricultural subsidies and input distribution programs, as funds and resources are diverted to private individuals, rather than reaching intended beneficiaries (Ogundari & Ojo, 2006).

Moreover, corruption in the Nigerian agricultural sector has been linked to land administration and allocation issues (Olayide, 2014). Bribes are often demanded to secure land titles or to resolve land disputes, which can result in the exclusion of marginalized groups from land ownership and hinder investments in agriculture (Olayide, 2014; Oluwatayo, 2009).

Furthermore, corruption within agricultural research and extension services has been identified as a barrier to the dissemination of knowledge and technology, stifling innovation and productivity growth in the sector (Olaniyan, 2008). The misappropriation of funds intended for research and extension services reduces the quality and availability of support for farmers, ultimately undermining agricultural development (Olaniyan, 2008).

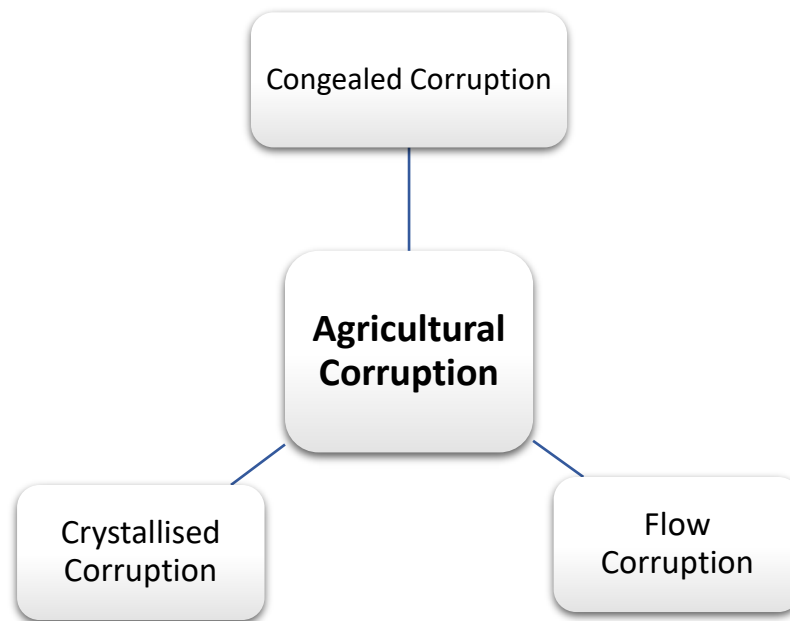
Several factors have been suggested as contributing to corruption in the Nigerian agricultural sector, including weak institutional capacity, lack of transparency and accountability, and patronage networks (Ogbeidi, 2012; Adesina, 2013). The inadequate enforcement of anti-corruption measures and the persistence of corrupt practices have been identified as key challenges in addressing corruption in the sector (Olayide, 2014).

Efforts to combat corruption in the Nigerian agricultural sector have included the introduction of anti-corruption agencies, such as the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices and Other Related Offences Commission (ICPC) (Amundsen, 2010). Additionally, the Nigerian government has launched various initiatives to improve transparency and efficiency, such as the Growth Enhancement Support (GES) scheme, which aimed to automate and streamline the distribution of agricultural inputs (Adeoti et al., 2017).

However, the effectiveness of these measures remains a subject of debate, as corruption persists in the agricultural sector (Ogbeidi, 2012). Scholars have called for a more comprehensive approach to addressing corruption, emphasizing the need for institutional reforms, improved accountability mechanisms, and enhanced civic engagement (Adesina, 2013; Olayide, 2014).

Many scholarly attempts had been made at defining corruption over the years. This study, as an a priori expectation, defines corruption as the venal practices, behaviours, culture, norms discoverable within organisational processes that cripple the achievement of predetermined standards. According to this study, corruption extends beyond mere embezzlement and bribery, to include various unscrupulous practices, behaviors, norms and attitudes that hinder achievement of pre-set organizational goals (Ashforth & Anand, 2003; Liu, 2016). In agriculture, corruption can manifest as deviations from standards, such as ill planning, procurement of substandard technologies, and nepotistic practices (Beck et al., 2017; Godson-Ibeji et al., 2016; Reyes, 2018). The study presents a framework categorizing corruption into three types: Congealed, Flow, and Crystallised Corruption.

Figure 1: Types of corruption



Source: Designed by the Author, (2023)

Congealed Corruption refers to activities that affect a project even before its commencement, such as misplaced priorities, poor design, planning, and external interferences (Elijah, 2019; Godson-Ibeji et al., 2016).

In the case of failed Regional Agricultural Programmes (RAP) in 1960 (Elijah, 2019; Godson-Ibeji et al., 2016). RAP had heavy colonial influences, such that determined the kind of crops to focus on. The country was indirectly influenced to focus on cash crops as against food crops, thereby earning foreign exchange that strengthen the Pound Sterling and discouraged trade to non-British colonies and also left the masses hungrier.

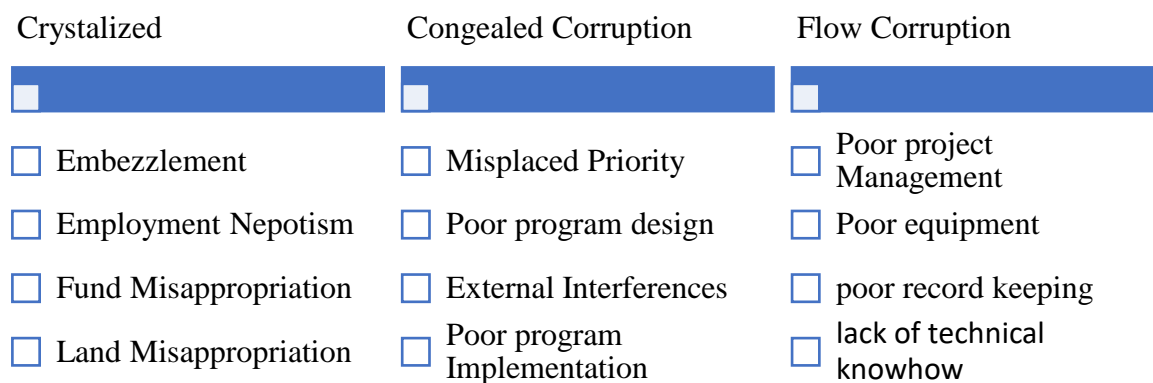
Flow Corruption includes hindrances that occur throughout the project lifespan, including intentional disenfranchisement of specific groups, use of poor-quality equipment, poor project management and record keeping (Godson-Ibeji et al., 2016; Graycar & Sidebottom, 2012; Mattoni, 2020; Zhang et al., 2017).

Crystallised Corruption pertains to overt, detectable forms of corruption, often involving illicit exchange of money or resources (Mattoni, 2020; Thompson, 2013; Mile et al., 2021). So, when

money and material gains are directly involved and an attempt to install a false presence to cover up illegalities on financial and material gains, this is conceived as crystallised corruption. When it has nothing to do with control and power, but just the monetary gains, lands and other material things, then it is a crystallised corruption.

The research aims to demonstrate the presence of these corruption types in Nigeria's agricultural sector and suggest that process automation could potentially mitigate such practices (Mattoni, 2020; Thompson, 2013).

Figure 2: Nigeria Conceptual Agricultural Corruption in Summary



Source: Designed by the author

2.3.1 The Impact of Corruption on Nigerian Agricultural Programs

Corruption has been a significant challenge in Nigeria, affecting various sectors, including agriculture. Several agricultural programs have been implemented to boost food production, create employment, and reduce poverty. However, the success of these programs has been hindered by corruption. Below are some of the impacts of corruption on Nigerian agricultural programs that have contributed to their failure.

Misappropriation of funds: Corruption has led to the misappropriation of funds allocated to agricultural programs in Nigeria. Money intended for the implementation of projects, subsidies, and capacity building often ends up in the hands of corrupt officials, leaving programs underfunded

and unable to achieve their objectives (Osaghae, 2014). This does not only limits the effectiveness of the programs but also leads to a lack of trust in government initiatives among farmers and other stakeholders (Obasi, 2018).

Inefficient distribution of resources: Corruption frequently plagues the distribution of resources like seeds, fertiliser, and equipment, which results in an ineffective distribution of these resources. To deliver subsidised inputs, for instance, middlemen and government officials may seek bribes or redirect them for their own benefit (Adebanwi & Obadare, 2011). The goals of agricultural programmes are eventually undermined as a result of real farmers being unable to obtain the resources, they require to increase their output (Ayodele & Sotola, 2015).

Patronage and nepotism: Corruption in the form of patronage and nepotism has resulted in the awarding of contracts and the allocation of resources to unqualified individuals or companies. This undermines the quality of work and often leads to the failure of agricultural projects, as well as the inefficient use of resources (Ogbeidi, 2012). Furthermore, patronage and nepotism can lead to the exclusion of qualified and deserving farmers from participating in government programs, perpetuating poverty and hindering agricultural development (Ogundiya, 2009).

Lack of accountability and transparency: Corruption has contributed to a lack of accountability and transparency in the management of agricultural programs in Nigeria. The absence of effective monitoring and evaluation mechanisms has allowed corrupt practices to go unchecked, further exacerbating the failure of these programs (Uzochukwu & Onwurah, 2014). Increased transparency is needed to ensure that funds are used efficiently and that the intended beneficiaries receive the support they need (Olaniyi, 2015).

Policy inconsistency: Corruption has been linked to policy inconsistency in Nigeria's agricultural sector, as successive governments often abandon or undermine previous agricultural initiatives for personal or political gain. This creates uncertainty and makes it difficult for farmers to plan and invest in their businesses, ultimately hindering the growth and development of the sector (Adebanwi & Obadare, 2011).

2.4 Corruption Index and General Impact Overview

The World Bank data group and other top statistics-provisioning platforms agree on the metrics for measuring corruption across countries of the world. The World Bank data group uses the “*country policy and institutional assessment (CPIA) index*” that rates the strength of public organisations’ policies in terms of governance and macroeconomic policies. It uses a scale of 1 (low) to 6 (high) to measure how good a country’s public policies are performing in the face of corruption, demands for transparency and accountability. In 2021, Nigeria scored 3 on the index, which has remained unchanged over the past sixteen years (World Bank, 2023). However, this index is good but not good enough for Nigeria as it only captures the activities of the executive arm of the government. Another weakness of this index is that it captures the outcome rather than the process involved in institutional arrangement and the quality of the country’s public policies, like the agricultural programs (World Bank, 2023).

Also, Trading Economics, (2023) provides a corruption perception index that ranks countries and regions considering how fraudulent or venal their public organisations and policies are perceived on the scale of 0 (very corrupt) to 100 (highly clean). On the CPI index, Nigeria ranked Nigeria 149th and 150th out of 180 countries, with a score of 24 out of 100 in both 2021 and 2022 respectively, indicating a high level of perceived corruption in the country's public sector. Between 1996 and 2022, Nigeria has gone as low as 6.90 and the highest rank was 28.00. This is indicative of a very poor trend of perceived corruption in Nigeria (Trading Economics, 2023). The figure below shows the array of ratings that Nigeria has earned over the years.

Figure 3: Nigeria Corruption Index.



Source: Trading Economics, (2023)

Therefore, these two widely published and read statistics show that the Nigerian public organisations, including the agricultural sector, are plagued with corruption (Trading Economics, 2023; World Bank, 2023).

2.5 Automation

Automation is important to agriculture as a system within a system to drive all processes because it enhances productivity by forcing better practices on all, irrespective of political affiliations or ethnic background (Rendtorff, 2010). Process automation acts as the interpreter of complex project playbooks, which has the tendencies of accommodating unnecessary human interventions in areas such as fund allocation, land allocation, output sales and others (Karanina et al., 2023). In personnel engagement and performance review, automation of scoreboard and review processes exposes wrong hiring and gives room for immediate review. Therefore, for an existing and struggling agricultural program, automation makes it possible for superior management decisions through automatic generation from its management information system (MIS) protocol to review performances of both technical and administrative staff members respectively (Nguyen et al., 2023; Padhy et al., 2022). Automation helps in achieving agricultural program sustainability through automated monitoring systems. The audit and control are system-based in an automated environment and makes it possible for standards to be compared with actual results. This enhances

accountability, reliability and credibility to draw both local and foreign investments to increase production capacity (Du et al., 2022; Intel, 2023; Padhy et al., 2022) It goes without saying that automation would have produced a significantly positive output in the Nigerian agricultural programs had it been deployed and allowed to work over the last five decades.

2.5.1 Relationship Between Automation and Corruption

Automation and corruption share a complex relationship, with the potential for automation to both combat and contribute to corruption. Automation has been shown to improve transparency in bureaucratic processes, as it minimizes human intervention and reduces the discretionary decisions that can lead to corrupt practices (Bhatnagar, 2003). The implementation of e-governance platforms can enable citizens to track the progress of their applications or monitor government projects, making it more difficult for corruption to go unnoticed (Lewis, 2017).

By streamlining processes and reducing the need for personal interactions between officials and citizens or businesses, automation can also decrease opportunities for bribery and extortion (Bauhr & Grimes, 2014). The lack of direct contact makes it more challenging for corrupt officials to solicit bribes (Klitgaard, 2017).

Automated systems generate detailed records of transactions and decisions, which can be audited to ensure compliance with regulations and detect irregularities. This increased level of accountability can deter corruption by making it more likely for corrupt actions to be discovered and punished (Anechiarico & Jacobs, 1996).

Furthermore, automation can increase the efficiency of bureaucratic processes by reducing delays, cutting red tape, and minimizing human error (Bhatnagar, 2003). This not only decreases the frustration experienced by citizens and businesses but also reduces the motivation to engage in corrupt practices to expedite procedures (Bauhr & Grimes, 2014).

However, automation also presents potential risks and challenges that could inadvertently contribute to corruption. The implementation of automated systems often assumes widespread access to technology and the internet, which is not always the case. In areas where the digital divide is prominent, citizens with limited access to technology may be excluded from these systems, creating opportunities for corruption as intermediaries exploit their vulnerability (Norris, 2001).

As governments and organizations transition to automated systems, the risk of cyber-attacks and data breaches increases (Böhme & Moore, 2016). Hackers may attempt to manipulate these systems for personal gain or to facilitate corruption, making cybersecurity a critical concern (Zetter, 2017).

Automated systems rely on data and algorithms, which may be subject to bias or incomplete information. If these algorithms are designed with biased or incomplete data, they may inadvertently perpetuate existing inequalities or even create new forms of corruption (O'Neil, 2016). For example, an algorithm that prioritizes certain demographics or regions might result in preferential treatment and discrimination (Angwin et al., 2016).

Finally, while automation can bring many benefits, an overreliance on technology without adequate human oversight can result in unforeseen consequences (Bostrom & Yudkowsky, 2014). Striking a balance between automation and human intervention is essential to ensure that the systems work as intended and do not inadvertently create new opportunities for corruption.

Automation has the potential to significantly reduce corruption, but it is crucial to address the challenges and risks associated with it. Balancing technology with human oversight and addressing issues related to the digital divide, cybersecurity, and algorithmic bias are essential steps in harnessing the potential of automation to combat corruption.

2.5.2 The Potential of Automation in Curbing Corruption in the Nigerian Agricultural Sector

The Nigerian agricultural sector, despite experiencing considerable development since independence, has grappled with corruption, significantly undermining the effectiveness of agricultural programs (Oluwafemi et al., 2021). To overcome this challenge, it has been proposed that automation and digitalization, converting analog information into digital for easy storage and processing, could be instrumental (FAO, 2017).

Automation can improve the agricultural sector's efficiency and effectiveness by enhancing resource allocation, vendor management, procurement processes, and quality assurance (Garcia et

al., 2016). It also introduces a higher level of transparency and accountability, enabling the tracking and monitoring of crucial processes and performance indicators (Davies & Fumega, 2014). Furthermore, it can decrease opportunities for corruption by minimizing human intervention in processes such as procurement and fund disbursement (Lewis-Faupel et al., 2016).

By creating substantial amounts of information and reducing marginal costs, automation can increase production flexibility and make it challenging for officials to defraud the system. The introduction of sustainability accounting processes like economic, social, and governance (ESG) factors on decentralized platforms like the Blockchain could further mitigate corruption risk (Lewis-Faupel et al., 2016).

Simultaneously, the adoption of digital tools and platforms facilitated by automation can empower citizens to actively participate in monitoring and reporting corruption, leading to increased transparency and accountability (Davies & Fumega, 2014).

Therefore, a strategic investment by the Nigerian government in sophisticated automation technologies could significantly reduce corruption and foster sustainable growth in the agricultural sector. The integration of such technologies can help the sector overcome its challenges and realize its full potential.

THEORETICAL FRAMEWORK

The theories of Network Effect (Katz & Shapiro, 1986) and Robotic Agriculture (Blackmore, Stout, Wang, & Runov, 2005) provides valuable insights and guidance for the empirical analysis on process automation and corruption within Nigerian Agricultural programs. The framework provides a lens and a structure for understanding and interpreting the findings, and guiding the development of the research methodology

Network Effect: The theory of network effect suggests that a product or service becomes more valuable as more people use it (Katz & Shapiro, 1986). In the context of process automation in agriculture, the network effect can lead to increased adoption and utilization of automated systems. As more stakeholders in the agricultural sector adopt automation, the overall network of users

becomes more valuable, fostering the exchange of ideas, best practices, and innovation. Additionally, a larger user base can also contribute to improved system functionality, as feedback and user experiences can drive system refinement and adaptation. In terms of corruption, a broad network of automation users can increase transparency and accountability, making illicit activities more difficult to conceal.

Theory of Robotic Agriculture: This theory focuses on the utilization of robotics and automation in agricultural practices (Blackmore et al., 2005). It posits that automation can lead to increased efficiency, reduced labor costs, and improved crop productivity. In this context, the theory provides a framework for understanding how automation can transform agricultural processes in Nigeria. Automated systems can reduce opportunities for corruption by minimizing human involvement in critical processes, such as resource allocation and monitoring. Furthermore, automation enables more precise and objective decision-making, reducing the potential for biased or corrupt practices.

In empirical analysis, these theories guide the development of research questions, the selection of appropriate data collection and analysis methods, and the interpretation of findings. They provide a conceptual framework for understanding the complex relationships between process automation, corruption, and agricultural program outcomes in Nigeria.

Chapter 3: Methodology

In order to establish the nexus between process automation and corruption with regards to the Nigerian agricultural programs, the study adopted qualitative research design (QRD) to acquire the story behind the entire programmes. Qualitative research design is an approach that seeks to understand human behavior, experiences, and social phenomena through the collection and analysis of non-numerical data, such as interviews, observations, documents, and visual materials (Creswell, 2014).

Qualitative research design (QRD) is known for its attributes of providing clear details, samples, analysis and more profound attention to unusual situations (Almalki, 2016; Creswell, 2014). It emphasizes depth, context, and meaning, often using inductive reasoning to build theories and concepts from the data (Miles, Huberman, & Saldaña, 2014).

Unlike quantitative research design, qualitative research design is an unstructured, in-depth method. It assists researchers to formulate theories and build uncommon understanding.

This approach was deemed appropriate for the research because it provides the tool that allows for the collection of rich, detailed data that can provide a deep understanding of interviews' perspectives, experiences, and the contexts in which they operate (Patton, 2015).

Overall, because of Qualitative Research Design's exploratory potential it is well-suited for exploring the nuances of the research to gain clarity about the failed agricultural programs and to get insight on what can be done differently.

3.1 Sample description

The sample for this study was collected from Nigeria since it was meant to investigate the country's agricultural programs' performances within an automated. The interviewees were current or recent former senior officers from agricultural research institutes that had participated in the implementation of the program as a whole or impacted in any of the Nigeria's agricultural programs. Others were Senior University Dons, Professors or Farm Managers that taught or were directly affected by the programs and other agricultural policies in Nigeria. The following table shows succinct descriptions of the interviewees:

Table 3: Short resume of the interviewees

Interviews	Designation	Experience	Duration
Interview 01	Farm Manager and former Agricultural Development Project (ADP) Senior Officer	Over 25 years of experience field experience in a university and government agricultural program support institute	00:35:59
Interview 02	Professor of Agriculture and Extension and Former Director of National Fadama Development Project (NFDP)	32 Years of experience in lecturing and agricultural institute.	00:56:25
Interview 03	Professor of Agricultural Genetics and former member of Federal Government Agricultural Sustainability Initiatives	Combined 29 years of experience in agricultural consulting and lecturing.	00:52:13
Interview 04	Professor of Agriculture, extension and projects evaluation	Over 30 years	01:36:17

Data on the interviewees

Source: elaborated by the author

3.2 Data collection

The data was physically gathered within a period of two weeks across various institutions in Nigeria through in-depth interviews. The first step was a professional approach to the various institutions and individuals using the University-approved letter of introduction.

Judgement sampling technique was used to select interviewees who met certain criteria such as years of experience, previous or current involvement in agricultural program-related career, and occupation of senior position in order to have access to more accurate accounts of what later became the realities of those agricultural programs. The organisations named guides or contact persons, who were physically briefed about the objectives of the study and why their organisations were the best fit for the study.

The research instruments used were in-depth interview questions and the questions were designed in an open format to allow the interviewees to express themselves freely. The questions were on the program designs, agricultural technologies and we tried to understand the knowledge and their experiences of the agricultural programs.

The next step was the recording of verbal permission to document the interview on a mobile device using Samsung Voice Recorder (SVR). These procedures, as simple as they may seem, were in perfect sync with the generic steps that were empirically tested by many researchers who adopted Qualitative Research Design (QRD) (KNResearch, 2020; Lester et al., 2020). The next steps on the data collection procedures are data organisation with proper names or labels and categorisation just before analysis is done.

Secondary data sources, including a review of pertinent literature, organizational documents, and annual reports, were meticulously examined to acquire a more profound comprehension of the relationship between process automation and corruption.

3.3 Data Analysis

This study adopted the thematic analysis for analysing of the interview data. This required that the study go through the following steps:

- a. Data preparation and organisation for analysis
- b. Audio data transcription to text data for intelligible engagement
- c. Data familiarization and description to identify patterns and
- d. Creation of data memos to log quotation groups
- e. Create groups in form of codes
- f. Creation of code categories and themes in line with predetermined variables
- g. Using relations or relational phrases to connect themes with comments
- h. Documentation, presentation and interpretation of qualitative research output

The first step required that the interview data properly labelled and copied into the computer software where transcription and or analysis will take place. The software using for data preparation and transcription was Atlasti. It is a modern computer-based qualitative data analysis software that has gained the acceptance and recommendation of researchers across all fields (Brito et al., 2017; Rittichainuwat & Rattanaphinanchai, 2015). The data is then transcribed into text format for readability. Every statement and nuances recorded were studied for patterns and similarities with the predetermined variables, namely automation and its proxies and corruption and its proxies before memos and quotes were marked for analysis and grouping into yet-to-be – determined data codes. These codes are short catch phrases or word that describe a group of similar opinions across the transcript by each interviewee (Brito et al., 2017). These codes, memos and quotations were linked intelligently using Atlasti’s relational phrases such as, “support by”, “continued by”, “contradicted by”, “expanded by”, and several others to create networks of agreement and disagreement on each and all of the code groups and quotation groups respectively. Having done that, the study proceeded to create an analytic discourse of the output as the result and the interpretation therefrom.

Chapter 4: RESULTS & INTERPRETATION

The empirical data derived from an exhaustive analysis of the transcripts based on the conducted interviews unveiled consistent and recurring themes pertaining to the elements influencing the effectiveness of agricultural programs in Nigeria. These emergent themes offer a nuanced understanding of the complexities inherent in the development and implementation of these programs. The findings identified five major categories of hindrances to the success of agricultural programs in Nigeria, namely: external and political interferences, inadequate program design, beneficiary selection bias, corruption, and marginalization.

External and political interferences: The unanimous assertion among interviewees was the detrimental influence of external and political interferences on the successful implementation of agricultural programs in Nigeria. They observed that such interventions often resulted in the endorsement of unsuitable, non-progressive programs, causing disenfranchisement among the targeted beneficiaries and undermining the overall credibility of the initiatives.

Inadequate program design and planning: According to the respondents, some programs, conceived externally, seemed commendable, they often were ill-suited to Nigeria's specific context. This theme highlighted that program failures were largely attributable to poor design and planning that failed to consider Nigeria's unique socio-economic environment.

Beneficiary selection and nepotism: The selection process of beneficiaries emerged as a major theme, where the professionals highlighted the prevalence of nepotism. They underscored that program benefits were frequently skewed in favor of politically connected individuals and their kin, thus fostering dishonest output reporting and hampering overall productivity.

Misappropriation of resources and corruption: A significant theme pertained to the rampant corruption within the system. Interviewees illuminated the reality of embezzlement of funds, unauthorized reallocation of resources, and gross mismanagement, depicting corruption as a formidable barrier to program success.

Ethnic and religious marginalization: It was noted that the impact of ethnic and religious marginalization on the successful roll-out of agricultural programs, highlighting the adverse effects of such disparities on program implementation.

While the challenges are manifold, the respondents suggested that automation could address some of these issues effectively. Automation, as a technological intervention, has the potential to bolster transparency, streamline the selection of suitable personnel, and monitor local content production and exports. However, they highlighted the necessity for automation to be immune to human intervention in critical areas and to be widely supported by leaders and relevant stakeholders.

They further stressed that in order to fully leverage automation's potential, socio-cultural factors must be considered, and automation initiatives must be harmonized with national needs and policies. This would facilitate consistent, coherent, and long-term planning, thereby ensuring the sustainability of the programs. Emphasis was also made on the importance of the participatory involvement of all stakeholders in the developmental stage to ensure transparency and inclusivity throughout the program processes.

Based on the collected responses, effective automation hinges on reliable data gathering and analysis. They suggested that incorporating automation at various stages of the program can enhance transparency, accountability, and sustainability. They also highlighted the imperative for the government to emphasize socio-cultural values and align programs with national policies. Ensuring that agricultural programs are congruent with national development plans, goals, and policies would greatly enhance their efficacy and impact.

S/N	Programme Processes	Challenges	Impact	Proposed Solution
1	Program implementation and completion	External and political interferences, poor management and employment nepotism	Disenfranchisement due to political affiliation, threats to life, sudden policy changes, hiring of unqualified personnel	Automation for monitoring project performance, mapping execution to locations with the highest production and distribution advantages, screening out unqualified applicants

2	Program conception, planning and design	Existing socio-cultural values and lack of understanding of local conditions hinder the implementation of automation in agricultural programs.	Automation solutions must be well-planned, considering socio-cultural factors and ensuring acceptance from grassroots. The ESG reporting for project evaluation can help ensure this.	Automation can succeed only when it is rooted in the socio-cultural context and backed by comprehensive planning and understanding of the local conditions.
3	Resource acquisition - human and materials	Incompetent workers in policy formulation and implementation roles and incorrect recruitment practices lead to inefficiencies and inaccurate reports.	Automation can be used to assess the performance of personnel, tying it to recruitment processes and compensation.	Automation can aid in ensuring competent personnel are in roles, enhancing overall efficiency.
4	Program implementation and completion	Poor data management and record-keeping impede successful automation.	Conducting a comprehensive agricultural census and gathering reliable data is a crucial step before implementing automation.	Solid data foundations are essential for successful automation and for ensuring the sustainability of results.
5	Program papers, approvals, and initiation	Inadequate legal backup for process automation leads to increased corrupt practices.	The constitution needs to be reviewed to empower process automation and enforce compliance.	Strengthening legal backing for automation is critical for ensuring accountability and compliance, ultimately reducing corruption.

Table 4: Summary of interview responses based on the challenges facing agricultural programs, the impacts and solutions.

RESEARCH QUESTIONS

To get better insight the author explored the research questions in the light of the feedbacks gotten from the interviews conducted.

Question 1: How does corruption affect the Nigerian agricultural programs?

According to all four interviewees, corruption manifests in different forms and significantly affects the success of the Nigerian agricultural programs. Issues such as political interference, nepotism in employment and beneficiary selection, misappropriation of resources and funds, and disenfranchisement of certain groups as some of the corrupt practices that plague these programs. Interviewee 1 and 2 suggest that externally imposed programs, though good, are often not the best fit for Nigeria as it tend to benefit a select few, primarily politically privileged individuals and their families, leading to dishonest reporting on output and reduced productivity. Interviewee 1 specifically mentioned that he observes that, corruption results in the diversion of program benefits towards politically privileged individuals and their families, rather than reaching the intended beneficiaries.

Interviewees 3 and 4 additionally point out poor program design and planning, lack of transparency, and conflicts with government policies as other corruption-related problems.

Question 2: What is the relationship between process automation and corruption in the Nigerian Agricultural Sector?

All interviewees agree on the potential of process automation to combat corruption in the Nigerian agricultural sector. Interviewee 1 insists on the need for "faceless" automation, which minimizes opportunities for human intervention in critical areas, thereby reducing chances for corruption. Similarly, Interviewee 2 emphasizes the importance of incorporating automation into the National Development Plan (NDP), monitoring local content production and export, and using automation to source for qualified personnel. Both Interviewees 3 and 4 also argue for the implementation of transparent, inclusive, and culturally-sensitive automation systems that align with national needs and policies, involve all stakeholders, and integrate reliable data gathering and analysis at every stage of the program. Thus, the relationship between process automation and corruption in the Nigerian Agricultural Sector can be seen as one where effective implementation of automation has the potential to significantly reduce levels of corruption.

Chapter 5: Discussion and Implications

The purpose of this study is to analyse the relationship between corruption and process automation in the Nigerian agricultural sector while focusing on the agricultural programs introduced since the country's independence in 1960.

From the interviews conducted, it was observed that corruption, although not explicitly discussed, subtly infiltrates the discourse through its various effects (Akinola, 2014). Critical stakeholders, including government agencies and policy implementers, emphasized the need for commitment and goodwill, indirectly shedding light on the negative impacts of corruption.

Corruption impedes Nigerian agricultural programs by obstructing effective allocation and utilization of funds. This results in inadequate infrastructure and limited access to crucial resources such as equipment and technology (Obi, 2016). Furthermore, corruption undermines transparency and accountability in agricultural programs, leading to mismanagement, inefficiencies, and diminished public trust.

The fusion of network effects and robotic agriculture holds the promise to revolutionize the Nigerian agricultural sector. Nonetheless, realizing this potential comes with an array of challenges, namely socio-cultural constraints, recruitment shortcomings, data management issues, and legal limitations.

The impact of socio-cultural norms and lack of understanding of local conditions can significantly hinder the deployment and acceptance of automation in agricultural programs. As highlighted by Eastwood et al. (2019), understanding these norms and the environment they create is pivotal in successfully harnessing network effects and integrating automation in agriculture. Therefore, comprehensive planning and understanding of the local socio-cultural conditions should precede the implementation of these technological innovations.

The theory of Network Effect, which denotes the idea that the value of a product or service increases as its usage becomes more widespread (Metcalfe, 2013), is particularly applicable to the integration of automation in Nigeria's agricultural sector. By promoting the widespread adoption

of automated technologies, their inherent value, along with the overall agricultural productivity, could be significantly improved (Shah, et al., 2017).

Robotic Agriculture, involving the application of robotics and automation to enhance farming practices (Blackmore et al., 2005), could substantially mitigate the issues faced by Nigerian agricultural programs. The impersonal and unbiased nature of robotic systems may curtail corrupt practices and nepotism. Moreover, automation in data collection and processing would bring about greater transparency and facilitate improved planning and resource allocation (Pedersen et al., 2017). By introducing more efficient and transparent systems, process automation could reduce opportunities for corruption and enhance accountability. For instance, automated systems could provide superior tracking and reporting of resources, minimizing the chances of misappropriation of funds. Additionally, process automation could help in identifying irregularities in processes or transactions, thereby discouraging corruption.

For the theories of Network Effect and Robotic Agriculture to be efficacious, comprehensive stakeholder engagement is crucial, from the conception to the output management stages. This approach aligns with the principles of democratic network governance, which emphasize collective action and participation (Sørensen & Torfing, 2005). Moreover, technological, sociocultural, and political factors must be harmoniously balanced in these automated processes to ensure their success.

At the same time, the successful implementation of process automation is not solely a matter of technology. It requires a robust commitment from critical stakeholders and effective government support and regulation. Addressing corruption is a paramount issue to ensure that the potential benefits of process automation are fully realized. In this way, the transformation of the Nigerian Agricultural Sector can be achieved, ensuring productivity, transparency, and sustainable development.

In summary, the theoretical frameworks of the Network Effect and Robotic Agriculture propose transformative potential for overcoming the problems plaguing agricultural programs in Nigeria. By implementing and promoting automated systems, the issues such as corruption, inadequate

productivity, and lack of transparency can be addressed effectively, creating a more efficient and accountable agricultural sector.

5.1 Limitations

- Access to information was limited because secondary information available did not reflect current realities and interviewees were a little skeptical about the absolute protection of their confidentialities.
- The time and fund available to drive the research through the length and breadth of the country most viable agricultural institutes and public offices were limited.
- The research was conducted during highly heated period of electioneering processes. The attitudes of respondents were skewed towards socialism and a dissenting voice against capitalist idea of rationality. The middle ground of neutrality might have grown tinier at the time, thereby creating some inevitable biases in the results.

Chapter 6: Conclusion

6.1 Summary of Findings

The study examined the relationship between process automation and corruption in the Nigerian agricultural programs and the research shows that corruption remains a significant impediment to the successful implementation of agricultural programs in Nigeria. It has been established that corruption permeates various levels of these programs, from conception to implementation, leading to ineffective subsidies, misappropriation of resources, and skewed benefits towards politically privileged individuals. This corruption is fueled by weak institutional structures, lack of transparency, inadequate enforcement of anti-corruption measures, and deeply entrenched patronage networks.

On the other hand, process automation emerged as a potential solution to mitigate the adverse effects of corruption. The theoretical frameworks, namely the Network Effect Theory and the Theory of Robotic Agriculture, provided valuable insights into how automation can be leveraged to promote efficiency, transparency, and accountability. Automation in agricultural programs could revolutionize operations, from sourcing for qualified personnel to monitoring local content production and export.

However, the successful implementation of automation is contingent upon several factors. The socio-cultural context of Nigeria, the need for alignment with national policies, and the involvement of all stakeholders are crucial for a successful transition to automation. Moreover, the critical role of leadership cannot be understated. The support and acceptance from community and political leaders are vital in driving the change towards a more automated and transparent agricultural sector.

However, it's important to highlight that while automation offers promising solutions, it is not a panacea. There is a need for a multi-faceted approach that combines automation with strong anti-corruption measures, institutional strengthening, and policy reforms. This approach should also include measures to address socio-economic factors such as poverty, income inequality, and political instability, which often act as breeding grounds for corruption.

6.2 Contribution to Knowledge

In light of these findings, it is hoped that this research will contribute to the ongoing discourse on process automation and corruption in the Nigerian agricultural sector. It is anticipated that the insights derived from this study will inform policy decisions and inspire further research in this critical area of development.

6.3 Recommendation for Future Research

Future research should consider a deeper exploration of how socio-economic and political factors interplay with corruption and automation in the Nigerian agricultural sector, along with an examination of other technological interventions beyond automation. Additionally, studies could focus on the practical implementation and impact assessment of anti-corruption measures in conjunction with automation strategies at different scales within the agricultural sector.

Another area of further research is investigating the role of leadership and political will in the successful implementation of process automation initiatives in Nigeria. This could involve examining the level of support and commitment from leaders, community leaders, and political leaders towards automation initiatives, and how their involvement or lack thereof impacts the outcomes of such initiatives.

6.4 Remarks

In conclusion, while this research has provided illumination on the potentials of process automation to counter corruption within the Nigerian agricultural sector, it also highlighted the advantage of a holistic, multi-faceted approach that takes into account Nigeria's complex socio-economic and political landscapes which is essential for truly sustainable and significant agricultural development.

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Resume

Seos protsesside automatiseerimise ja korrupsiooni vahel Nigeeria põllumajandus programmides

Uuringus uuriti protsesside automatiseerimise ja korrupsiooni vahelist seost Nigeeria põllumajandus programmides ning uuringud näitavad, et korrupsioon on endiselt oluline takistus põllumajandus programmide edukale rakendamisele Nigeerias. On kindlaks tehtud, et korrupsioon tungib nende programmide erinevatele tasanditele alates kontseptsioonist kuni elluviimiseni, põhjustades ebatõhusaid toetusi, ressursside väärkasutamist ja soodustusi poliitiliselt privilegeeritud isikutele. Seda korrupsiooni soodustavad nõrgad institutsionaalsed struktuurid, läbipaistvuse puudumine, korrupsioonivastaste meetmete ebapiisav jõustamine ja sügavalt juurdunud patronaaži võrgustikud.

Teisest küljest kerkis protsesside automatiseerimine esile kui potentsiaalne lahendus korrupsiooni kahjulike mõjude leevendamiseks. Teoreetilised raamistikud, nimelt võrgu efektide teooria ja robot põllumajanduse teooria, andsid väärtuslikku teavet selle kohta, kuidas automatiseerimist saab tõhususe, läbipaistvuse ja vastutuse edendamiseks kasutada. Põllumajandus Programmide automatiseerimine võib muuta toimingud, alates kvalifitseeritud töötajate hankimisest kuni kohaliku sisu tootmise ja ekspordi jälgimiseni.

Kuid automatiseerimise edukas rakendamine sõltub mitmest tegurist. Nigeeria sotsiaalkultuuriline kontekst, riikliku poliitikaga vastavusse viimise vajadus ja kõigi sidusrühmade kaasamine on edukaks automatiseerimisele üleminekuks üliolulised. Lisaks ei saa alahinnata juhtimise kriitilist rolli. Kogukonna ja poliitiliste juhtide toetus ja heakskiit on automatiseeritud ja läbipaistvama põllumajandussektori suunas liikumisel üliolulised.

Siiski on oluline rõhutada, et kuigi automatiseerimine pakub paljulubavaid lahendusi, ei ole see imerohi. Vaja on mitmekülgsel lähenemisviisi, mis ühendab automatiseerimise tugevate korrupsioonivastaste meetmete, institutsioonide tugevdamise ja poliitikareformidega. See lähenemisviis peaks hõlmama ka meetmeid selliste sotsiaalmajanduslike teguritega tegelemiseks, nagu vaesus, sissetulekute ebavõrdsus ja poliitiline ebastabiilsus, mis sageli on korrupsiooni kasvulava.

Appendices

1.0 Interview Questions

OPENING QUESTIONS

1. Please, tell us about yourself in the light of your career.
2. Kindly share your knowledge about any of the government agricultural programs, e.g Operation Feed the Nation (OFN), Green Revolution (GR) and or any of the others?

QUESTIONS ON POOR PROGRAM DESIGN, PLANNING AND POSSIBLE MISALIGNED AGRICULTURAL PROJECTS/SCHEME:

1. Was the conception of the programs by the Nigerian government solely internal, or were there external influences from world agencies or other powerful countries?
2. Were the intentions of the government behind launching agricultural development programs multi-faceted?
3. Do you believe that the intentions of the government for establishing any of the agricultural programs were adequately incorporated in the planning and design of the programs?
4. Did the programs, or some of them, conform to the socioeconomic, cultural, and technological realities of Nigeria at the time?

QUESTIONS ON EQUIPMENT AND AGRICULTURAL TECHNOLOGIES:

1. Could the use of poor equipment, including substandard equipment in programs such as the National Fadama program, have had any negative effects?
2. Could a shortage of funds or lengthy bureaucratic processes for funding approval and disbursement have contributed to the acquisition or leasing of substandard or inappropriate equipment?

3. Were appropriate and efficient technologies utilized in the agricultural programs?
4. Has there been any implementation of process automation in the Nigerian agricultural space, and if so, in what area(s) and how has it worked?
5. Do you believe that the implementation of process automation could potentially help combat corruption in Nigerian agricultural programs and schemes?
6. Were local personnel given sufficient training and opportunities for retraining to effectively operate and manage technologies and automation used in these programs?
7. Was there a proper system in place for the maintenance of equipment and technologies used in these programs?

QUESTIONS ON MISAPPROPRIATION OF RESOURCES AND FUNDS EMBEZZLEMENT:

1. Can improper allocation of land contribute to shortages in land for agricultural programs, and can this impact the success of those programs?
2. Do you think financial misappropriation and/or embezzlement had an impact on the outcomes of agricultural programs in Nigeria?
3. Was corruption a major issue that conflicted with operational and legal standards during the time when these agricultural programs were in operation?
4. Did process automation and technology play a role in monitoring the usage of resources in agricultural programs or schemes in Nigeria, and if so, how?

QUESTIONS ON POOR MANAGEMENT AND EMPLOYMENT NEPOTISM

1. Can automation enhance better management of agricultural programs?
2. Can process automation help in controlling nepotism and cronyism in employment on agricultural programs?

3. Is it possible for the government to harmonize all processes involved in agricultural programs with automation to achieve transparency and automation like it was done in the Ministry of Finance to achieve treasury saving accounts?

4. Are there other benefits that automation could have on agro-business in Nigeria?

2.0 Thematic Analysis of the respondent's interview

1 st Respondent							
s/n	Program Processes	Variables	Observations	Reasons for Failure	Effects	Solution	Summary
1	Program implementation and completion	External and political interferences	Non-progressive	Project implementations were kept among the privileged few due to political affiliation and readiness to compromise the standards. Misaligned loan issuance	Competent personnel left and corrupt ones became majority because they were kept out of the system because of their faithful and progressive stance.	Automation can help monitor project performance beginning with staff performance	Natural selection becomes inevitable once staff retention becomes performance-based.
2	Program implementation and completion	External and political interferences	Political disenfranchisement and threats to life characterized some of the programs as a result of elections' voting favours.	Political disenfranchisement and threats to life	The part of the country that did not favour the ruling government at the pools were ill favoured with the programs.	The process of agricultural program implementation should be automated to map execution to locations with highest production and distribution advantages, irrespective of the voting preferences of the location	Automation must be faceless and work without prejudice of favours.

3	Program implementation and completion	Poor Management and Employment Nepotism	Sudden change of policies under the national directorate of employment (NDE) by the government.	Unqualified people were hired and government in return refused to buy back the produce of the farm.	Resources were wasted and government agricultural programs lost credibility	Application of a process automation platform will be perfect to screen out unqualified applicants.	Govt did not fulfill their promise to buy outputs from the farm
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2nd Respondent

SN	Programme Processes	Variables	Observations	Reasons for Failure	Effects	Solution	Summary
1	Program papers, approvals, and initiation	External and political interferences	If leaders perceive their power as threatened by internally designed programs, they may reject them. Although they may be more receptive to externally conceived programs, political apathy and frustration could still hinder the implementation of an automated system.	Bypass of the automated system and political apathy.	If introduced, productivity will be enhanced and corruption will be reduced.	Process automation must be preceded	Automation is good but the leaders and community leaders and political leaders must accept it before it can be used; It does not matter if it was deployed, they will bypass it
2	Deployment of resources and execution of program	External and political interferences	The Operation Feed the Nation (OFN), for example, saw village heads intercepting fertilizer and seedlings allocation that was automated. Benefiting farmers were not allowed to take delivery directly.	Interception, threats, aggression and illegal reallocation of resources.	These resources were sold to other parts of the country to the highest bidders and the money is shared among the village leaders, thereby reducing the expected capacity of the program from the corruption-laden area.	Strict monetary through barcoded acceptance of delivery within the automated system.	Automation is capable of correcting illegal reallocation of resources.

3	Deployment of resources and execution of program	Poor Management and Employment Nepotism	In other programs, farmers were overbooking fertilizer requirement by state because there was no proper monitoring and also because the people in charge were related to government officials and so they could not be prosecuted.	Overbooking of resources, insider trading, conflict of interest and cronyism in employment.	The excess was sold to parts of the country at an exorbitant price.		
4	Program conception, palning and design	Poor Program Design and Planning	Loans from external programs were taken and not paid back. Those who were given processing machines ground them because they believed the automated process could take the employment value of the workers and thereby increase unemployment.	Intentional	Some of the automation technologies were abandoned while others were sold without permission.	Process automation would have been ideal.	Personal and political interests that conflict against national interest must be taken care of before automation is implemented.
5	Performance correction and injection of new idea/solutions	Poor Equipment and wrong technology	Abandonment of resources - technology and equipment - and concentration of efforts in areas that politically favoured but has no natural agricultural advantages.	Deliberate disenfranchisement and abandonment of technology and equipment.	Farmers in disadvantaged areas concentrated on food crops instead of cash crops for subsistent living but no increase in income.	Automation can be used to implement ESG to ensure investment is directed to areas of highest production advantage, not political advantage.	All assets and personnel, including their roles and performances are to be included in the database of the automated process to avoid theft and retention of poor performer respectively.

6	Program conception, planning and design	Poor Management and Employment Nepotism	Production of cash and food crops in commercial quantity but there were no government alliances to foster export to other countries.	Poor business market environment that favour the few powerful farm owners.	Export-driven production reduced drastically and concentration was on food crops for local market and personal consumption.	Automation can help map count and capacity of all farmers and farms respectively and match incorporate this map into the NDP and its implementation.	The people - leaders and th led - must believe and accept the idea for automation.
7	Performance correction and injection of new idea/solutions	Misappropriation of resources and funds embezzlement	The systems has not been ready to allow automation some of the processes that could lead to innovative income generation, like the repealed ban on the consumption of animal skin.	The system kicked against automation of the processing of animal skin into leather for shoe and bag production and moved to reverse the ban on animal skin consumption.	Leathers and finished products are imported to the country despite massive production of cows, goats and sheep, thereby causing the few privileged exporters to swamp the markets against local farmers.	Segregated automation can be used to implementation and monitor local content production and export through surveillance of sabotages.	We need to separate each of the processes and automate them one after the other and them aggregate the monitoring for usage of various agencies, including lawmakers and law enforcement agencies.
8	Deployment of resources and execution of program	Poor Management and Employment Nepotism	Ethnic and religious marginalisation are major reasons different interest groups in the country give for accepting unqualified persons at the helm of affairs.	Ethno-religious employment	Incompetent, reduced production and corrupt practices.	We can use automation to source for the best hands and back the implementation up with the law.	Before this is done, the people at the grassroot and the government must be on the same page.
9	Program conception, palnning and design	External and political interferences	There are misconception about agricultural projects - foreign is better than local. This has created a distract from toeing the path of relevance to the Nigerian reality.	Preference for foreign items exported by powerful and connected few.	Destruction of local markets	Automation can be used to execute protection for local and infant industries and companies, especially those that are directly connected to the agricultural sector.	It will suggested that foreign aid and foreign programs should not be taken 100%. They must be in line with the NDP because acceptance.

10	Program monitoring and audit	Misappropriation of resources and funds embezzlement	The level of impunity in the country is higher among government officials. If people at the center cannot give account of their wealth, it will difficult for them to audit personnel on agricultural programs	impunity and lack of swift punitive measures against corrupt practices at the highest levels of the society.	It becomes a socio-cultural issue when leaders and the families commit crimes and the go free; members of the public will take it that the corrupt at the smartest and celebrated.	Automation can definitely help to track individual wealth acquisition overtime and ensure illicit direct and indirect financial gains are not acquired	Everyone is free to acquire wealth, but such acquisition must possess logical explanation in the face of the law.
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3rd Respondent

SN	Programme Processes	Variables	Observations	Reasons for Failure	Effects	Solution	Summary
1	Program conception, planning and design	External and political interferences	Some programs were imported, but some of the programs were not bottom-up. This made acceptance difficult by the people at the bottom of the pyramid.	No proper stakeholders' engagement.	Rejection due to lack of understanding and acceptance from bottom-up.	Automation is seen as an undue regulation by a faceless control system. The nature of the people on ground needs a change in value system before automation can really take effects.	Socio-cultural factors must be considered when automation is to be deployed.
2	Program output management and reinvestment	Poor Program Design and Planning	Many of the reinvested gains were observed to have ended up with unintended beneficiaries and political cronies of the people in power.	Favouritism and personal interest	Stagnated agricultural programs	Automation can help map and track gains and reinvestment of gains such that they will not end up be siphoned by corrupt people.	A faceless and bottom-up automated system will achieve selection without favours nor prejudices.

3	Failure	Poor Program Design and Planning	Some of the current examples automation in Nigeria are the salary payment platform and the bimodal voters' accreditation system, and the are successfully rigged to favour connected few.	Improper automation giving room for corrupt practices. Lack of transparent at development stage.	Benefits are delayed, decreased and denied with little or no resolution.	All stakeholders must be involved in the development stage of an automated system - government, citizens and private vendor/contractors.	There is no truly transparent process automation without the involvement and agreement of all stakeholders during information gathering stage of the development.
4	Performance correction and injection of new idea/solutions	Poor Management and Employment Nepotism	Government policies must be aligned in such a way that support process automation.	Bad government policies that conflict the programs.	Abandonment of technologies that works to expose bad governance.	There should be single standard - process automation must be born out of government policies that are bottom-up.	New ideas will work if they were born out a transparent government policy that was developed bottom-up.

4th Respondent

IT	Programme Processes	Variables	Observations	Reasons for Failure	Effects	Solution	Summary
1	Program conception, planning and design	External and political interferences	There are intrinsic factors that stand between process automation and its success in any program, especially agric. These are wrapped in social	The value system is Nigeria celebrates corruption and crowns it as a model for success while honesty and transparency is persecuted and disenfranchised	It becomes socio-culturally pandemic since families and friends condemn intention to automate against the corrupt practices of their bread-winner.	Automation will enhance the success of any project, even agricultural programs.	Automation without a change of value system is like cutting a tree with the blade but not from the root. It is just a matter of time, it will sprout again.

			values or value system in Nigeria.				
2	Program conception, planning and design	External and political interferences	Many of the supporting projects within the programs were not well-planned because there was no sustainability because of cultural differences and availability of historical data.	Many of the government-backed farms had long gone moribund because of lack of continuity and intentional efforts by one ethnic group to frustrate the success of others within the same country.	There was one-sided success and aggregated national failure.	Well-planned automation process that nullifies or defies cultural differences weaponization.	All automation must be well-planned to accommodate existing socio-cultural problems before implementations approved.
3	Program conception, planning and design	Poor Program Design and Planning	Most of externally induced programs are top-bottom. They did not really understand the Nigerian situation from the grassroots, where the problems bite the deepest before implementation.	Ill-researched externally induced programs that lacked the capacity to solve the Nigerian kind of situation. Misaligned solution.	Lacked intrinsic acceptance and therefore was frustrated bottom-up while resources were wasted.	Process automation could help run both market and case study analyses of what works and does not for the country before it is accepted, irrespective of its origin.	The ESG reporting for project evaluation can easily be automated on the Nigerian agricultural programs to ensure a bottom-up fitness and acceptance, thereby avoiding misaligned solutions.
4	Program papers, approvals, and initiation	Poor Program Design and Planning	A lame dog policy with handicapped constitutional provisions.	No strong legal back-up.	Increased corrupt practices	Review of the constitution in such a way that it empower process automation to enforce compliance, I on its way.	Process automation without adequate and strong constitutional backup is a waste of resources.

5	Resource acquisition - human and materials	Poor Management and Employment Nepotism	Engagement of incompetent workers in positions for policy formulation and implementation, either by election or appointment.	Wrong and unchecked recruitment	Cooked and doctored reports have characterised some of the agricultural programs because incompetent leaders and workers had to do something to cover up.	The key performance indices of a personnel, elected or appointed, can be automated and tied to recruitment process and commission or remuneration.	Automation can help round a square peg into a round hole, if deployed and allowed.
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