
**PUBLIC SECTOR INNOVATION AND ORGANISATIONAL
EFFECTIVENESS IN THE 21ST CENTURY: EXPERIENCES AND LESSONS
FROM THE 4TH INDUSTRIAL REVOLUTION**

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Abstract

The focus of this paper is to critically examine public sector innovation and how it can enhance organisational effectiveness in the 21st Century. It argues that public sector innovation involves the introduction of new ideas that create value for society. It examined innovations and best practices in the public sector: international, continental and national experiences. The paper adopted a qualitative approach to research and analysed data gathered from secondary sources thematically. Major findings from an examination of the Nigerian experience reveal that innovation efforts side-by-side with public sector reforms were invigorated following Nigeria's return to democratic rule in 1999. It also revealed that despite noble intentions of the innovations/reforms in the public sector to address leakages in government resources, service delivery, and inefficiency, several challenges continue to impede efforts at innovation. These include leadership, the changing environment, and growing citizens' expectations, globalization, resource constraints, challenges of embracing emerging technologies, the politicization of public sectors, and fear of change. The paper concludes that while the 4th Industrial Revolution (4IR) comes with its disruptions, it is notable that innovations and technologies in the context of the 4IR provide room for innovations in the public sector for effective service delivery in the public sector organisations in the 21st century.

Keywords: Innovation, Organisation, Effectiveness, Nigeria, 4IR

Introduction

Governments are always seeking to innovate in terms of how they work, the services they provide, and how they provide them. They also seek to innovate in how they interact with citizens, businesses, and civil society. The drivers for innovation in the public sector in the 21st century consist of different domestic as well as global forces. These include, but are not limited to globalisation, rising new technologies, changing expectations of citizens, and increasingly complex problems facing governments, particularly against the backdrop of the recent COVID-19 pandemic and resultant economic crisis and

constricted budgets. Against this backdrop and despite the divergences of approaches to innovation, the consensus seems clear, that public sector organisations need to find new ways of working and doing things to be effective in the 21st century.

Innovation is generally understood as something new, capable of being implemented, and has a beneficial impact on intended sectors of society. Innovation is not an event or activity, rather, "it is a concept, process, practice, and capability that defines successful organizations" (Serrat, 2017, p.1). Public sector innovation involves the introduction of new ideas that create value for society. Through

innovation itself is not new, increasingly public leaders around the world are becoming more conscious of the need to create innovative solutions that can effectively address some of our most pressing societal challenges. While innovation in the private sector is viewed as one of the five key drivers of productivity, together with investment, skills, enterprise, and competition, in the public sector, innovation is concerned with efficiency within the public sector and strongly aligns with service delivery. Innovation is widely recognised by economists, businesses, and government as a key catalyst for growing economic productivity, driving enterprise, creating new products and markets, and improving efficiency, delivering benefits to firms, customers, and society in general. Public sector innovation in Africa has been pursued side-by-side with public service reforms (Olaopa, 2009a). These were driven by “economic reform, democratization and the search for administrative efficiency with a view improving the quality of good and service delivered to the public” (ECA, 2010, p.6). These were inspired by the experiences of other countries outside Africa. Notable examples include the radical transformation of administrative culture in the United Kingdom under Margaret Thatcher and her successors (1979-1998), the Government Performance and Results Act (1993) in the United States, the total quality management movements in several Southeast Asian countries, and the decentralized management initiative in several Latin American countries (Adamolekun & Kiragu 1999). The British government strongly argued that innovation in public services holds the key to overcoming the challenges of the 21st century. The 2008 Innovation Nation White Paper, stated that for the nation to maximise productivity, it needs to draw on knowledge and ideas from both the private and public sectors to create more effective public service delivery. The White

Paper stated that: “Innovation in public services will be essential to the UK’s ability to meet the economic and social challenges of the 21st century...demand is growing amongst public services that are personalised to their needs.” Within Africa, it has been argued that Botswana is a good example in terms of innovations and best practices given its reputation for good institutions, prudent macroeconomic management, political stability, and efficient civil service. The country is the embodiment of enviable constitutional order, a law-based state, and respect for the rule of law, which has strengthened state legitimacy, leadership succession, and political stability.

The Nigerian experience shows that efforts at repositioning the public sector for improved performance and service delivery predate Nigeria’s independence. However, when the Obasanjo administration assumed office on May 29, 1999, after years of military rule, it identified a public sector that was characterized by inefficiency in service delivery, insensitivity to the general welfare, indifference to the norms guiding the conduct of public officials and rampant corruption (Olaopa, 2009c). The government sought to innovate the public sector through reforms that were designed to focus on the core functions of government, namely, policy making, service delivery, value orientation, and accountability. These culminated in nine areas of reform, namely, civil service, pay, integrated payroll and personnel information system, public expenditure management, SERVICOM-service delivery, monetization of fringe benefits, pension, and anti-corruption (Olaopa, 2009).

Innovations and technological advancements in the 21st century, particularly in the context of the Fourth Industrial Revolution (4IR) or Industry 2.0 are challenging traditional management and governance norms in the public and private

sector organisations globally. These innovations and technological advancements have been referred to as a set of disruptive technologies ‘that are transforming social, economic, and political systems, and putting pressure on leaders and policy-makers globally. While the 4IR, is characterized by breakthroughs in areas including “artificial intelligence (AI), big data, fifth-generation telecommunications networking (5G), nanotechnology and biotechnology, robotics, the Internet of Things (IoT), and quantum computing, amongst others, are challenging service delivery in the public sector organisations. How should public sector organisations innovate to achieve effectiveness against the backdrop of these changes?

The focus of this paper is to critically examine public sector innovation and how it can enhance organisational effectiveness in the 21st Century. The paper is divided into sections as follows: introduction; conceptual clarifications; a brief history of public sector innovation; innovations and best practices in the public sector: international, continental and national experiences; challenges confronting public sector organizations in the 21st century; organisational effectiveness in the 21st century: a case for radical public sector innovation; concluding reflections: the broader context for public sector innovation.

Conceptual Clarifications

The key concepts defined in this section are the public sector, innovation, and organisation effectiveness.

Public sector

The term public sector or service indicates a wider scope than the civil service. The

public sector is usually comprised of organizations that are owned and operated by the government and exist to provide services for its citizens. The public sector also refers to all government organizations, including the federal government, states, and localities. Public-sector organizations focus on services to the public as a whole, including education, welfare, the legal system, employment, natural resources, health services, electricity, works and housing, fire service, gas and oil, infrastructure, law enforcement, police services, postal service, public transit, social services, and waste management. We may define public service as the machinery of government, that is, the totality of services that are organized under public authority. It is the totality of the administrative structures within which the work of government is carried out. A more governance-oriented definition views the public sector as the nature and mode of operation of the state in presiding over the public sector and covers the following categories of institutions. They include: the civil service in the ministries, departments, and agencies of government; the legislature and judiciary; local governments; public or state enterprises, boards, and corporations generally referred to as parastatals which operate and provide service in areas such as water and electricity; the security forces; the professional regulatory bodies which are given the power to prescribe training required for members; to regulate the conduct of members and to prohibit the unqualified from practicing. To further clarify the concept of the public sector, we compared it with the private sector as shown in the table below.

Table 1: Comparison of Public Sector and Private Sector

	Public Sector	Private Sector
Types of Organizations	Government	For-profit businesses
Types of Goods Provided	Public goods that benefit all	Private goods that benefit individuals, businesses, organizations
Ownership	The public	Individuals, shareholders
Profit-Making?	No	Yes
Types of Workers	Civil servants	Employees and independent contractors

As indicated above, one of the major differences between the public sector and the private sector is the profit drive, which is also a major propeller for private sector innovation to ensure market domination. It is against this backdrop that innovation as a creative idea has traditionally been associated with the private sector. However, it is not only the private sector that innovates. Public sector entities also innovate by introducing new approaches to provide quality public services and better respond to society's needs. The public sector includes all public corporations and the general government at the central, state, and local levels. Its duties cover administration, ensuring public order and safety, education, health and social care, and a variety of other functions for citizens and businesses.

Innovation

Innovation is about responding to change creatively. It entails the introduction of, and the practical implementation of ideas that result in the introduction of new goods or services or improvement in goods or services being offered. Though there are several definitions of innovation, the most common element in the definitions is a focus on newness, improvement, and the spread of ideas or technologies. Innovation often takes place through the development of more effective products, processes, services, technologies, artworks, or business models that innovators make available to markets, governments, and society. Innovation is related to, but not the

same as, invention. Innovation is more apt to involve the practical implementation of an invention to make a meaningful impact in a market or society, and not all innovations require a new invention. For this paper, innovation refers to two processes of change in an organization or society. First, it refers to putting new ideas into useful practice (UNDESA 2007). In the views of Adair (2007, p.5) innovation "combines two major overlapping processes: having new ideas and implementing them". Secondly, innovation is also about doing old things in new and better ways by an organization or society to meet its challenges (Aldair 2007).

Organizational Effectiveness

Organizational effectiveness can be defined as the efficiency with which an organization can meet its set objectives. It means an organization that produces the desired effect. Such an organization is not only productive but also does so without waste. Organizational effectiveness is therefore all about organizational efficiency. Each individual within the organization does everything he/she knows how to do and does it well. In other words, an organization can produce the desired results with a minimum expenditure of energy, time, money, and human and material resources. The desired effect will depend on the goals of the organization, which could be, for example, making a profit by producing and selling a product. An organization, if it operates efficiently, will produce a product without waste. If the organization has both

organizational effectiveness and efficiency, it will achieve its goal of making a profit by

producing and selling a product without waste.

Figure 1: Organizational Effectiveness



Source : <http://dandavatigroup.com/organizational-effectiveness/>

Typologies of public sector innovation

Public sector innovation differs according to the interventions and changes in processes being made. IDeA (2005) identified typologies of public sector innovation to include:

a. Service and production innovation:

This involves the development and use of technologies in the public sector. An example of this regard is the introduction of the Integrated Payroll and Personnel Information System (IPPIS), which is a system to eliminate the wastages noticed in the payroll administration of the public service (Olumide, 2015).

b. Delivery innovation: This involves new ways of solving tasks, delivering services, and interacting with service users in supplying services. An example in this regard is the Service Compact otherwise known as SERVICOM

c. Conceptual innovation: These are innovations that introduce new missions, worldviews, objectives, strategies, and rationales. An example is the concept of change begins with you.

d. Social innovation: social innovation involves innovating through ideas, concepts, and processes to more effectively meet social needs .It may incorporate some of the above-mentioned typologies. Examples of social innovations include such things as the creation of social enterprises by resident groups and the provision of broadband services by resident groups in isolated areas.

e. Organisational innovation: involves new or altered ways of organising activities within a public organisation. It includes the introduction of reforms, adoption of technological advances, implementation of modern management techniques, and strong leadership transformed public organisations. This form of innovation is the focus of this paper.

A Brief History of Public Sector Innovation

The growing momentum of public sector innovation has roughly evolved through stages, with every stage representing some improvement from the previous stage. Generally, the need to enhance public

management since the 1970s and improve public sector performance has seen an evolution from its 'traditional', to 'new public management' and is currently characterized by 'networked governance. Even so, despite the implementation of technological innovations in governance, elements of traditionalism still thrive in countries such as the United Kingdom, the United States, and Australia. The first stage recognized that innovation in government between the 1970s and 1980s was largely an area of study by academics (Gray, 1973). During this period, academics sought answers to questions of why, when, and how to innovate. Over the past four decades, public managers have recognized the possibilities and imperativeness of innovation. The second stage had to do with not just recognising why innovation is important, but also what it looks and feels like. Public leaders may still not characterise successful change initiatives as 'innovation', but they have a sense of how the concept applies to the public sector.

For instance, innovative uses of information technology and web 2.0 solutions vis-à-vis citizens are often dubbed 'innovative' (Bason, 2010). In addition, increasing academic interest has meant that there is now a significant platform for research-based analysis of the dynamics of public sector innovation. The third stage of public sector innovation has to do with the inherent barriers and challenges facing public innovators (Bason, 2010). The reality that innovation in the public sector is quite a challenge is not new. The public bureaucracy is always reluctant to accept change and this has negative implications for innovation. For example, Graham Allison's work titled *Essence of Decision* on the Cuban Missile Crisis stated that government bureaucracy is 'indeed the least understood source of unhappy outcomes produced by the US government (1971, p.266). James Wilson stated in the classic *Bureaucracy* (1989), we ought not to be

surprised that organisations resist innovation since they are supposed to resist it. Outside creating awareness and understanding barriers, some organisations are now receptive to increasing the ability of public organisations to make innovation happen (Albury, 2005). Government leaders both in developed and developing countries are increasingly accepting the possibilities of innovation, thus working towards institutionalizing innovation.

Governments are increasingly understanding the need to assess and reassess the public institutions in their countries. This is imperative because even though they may have served the 20th century, that may no longer lead to organisational effectiveness and serve the purpose of the globalized, networked, and knowledge-driven society of the 21st century. Accordingly, countries have been introducing public sector innovations to improve public service delivery.

Innovations and Best Practices in the Public Sector: International, Continental, and National Experiences *International Experience*

In Britain, the National Health Service's Institute for Innovation and Improvement (NHSI) involved physicians, nurses, and patients directly in radically improving new treatments and service processes. In Brazil, the innovation centre known as Centro de Gestao e Estudos Estrategicos (CGEE), a government-owned unit, used new web-enabled tools like a Future Timeline to visualize trends and generate a better basis for decision-making, thus providing strategic insight to policymakers. In Rio, Restorative Circles, a community-based justice movement supported by the Ministry of Justice, helped to reduce violent crime dramatically through new approaches to conflict resolution in crime-ridden neighborhoods. In the United States, the Transportation Security Administration applied human-centered design to reinvent

how citizens experience airport security. By getting feedback on citizens' journeys, the agency developed new solutions to improve the efficiency and experience of airports and enhance the level of security. To drive innovation efforts, the Obama administration included public sector innovation in a new national innovation strategy. It also opened up access to data through new online platforms, allowing citizens, businesses, and social innovators to find new valuable uses for the information stored in public databases. The US also introduced a White House Office of Social Innovation, which invests in effective social ventures through an innovation fund. In Australia, the Commonwealth government proposed a new strategy to foster a culture of innovation in government. The Victorian Public Service launched an ambitious Innovation Action Plan to embed innovation and cross-cutting collaboration in the civil service. In France, Paris-based *La 27e Région* works as a social laboratory for the country's 26 regional councils, applying service design and other innovation approaches to tackle challenges in the fields of education, urbanisation and city development, and social cohesion. For instance, they have helped involve local communities and students in co-creating the architectural blueprint for entirely redesigning a high school in the south of France. These examples of public sector innovations from different countries in the world show that despite significant barriers, it is possible to systematically apply the practices and tools of innovation that are embodied by these organisations to create radical new values.

African Experience

According to African Development Bank (2005), the terms "state" and the "public sector" have been used synonymously in the African context because there can be no strong state without an efficient public

sector. Several historical dynamics and intricacies have shaped and continue to shape the African public sector, hence the need to understand its innovation and reform processes from this dimension. These include the nature of the post-colonial state and neo-liberal economic policies implemented by African states have had varied implications on the African public sector. For instance, reasons advanced to justify structural adjustment programs (SAPs) of the 1980s and early 1990s were that most of the African public services were oversized and thus represented a budgetary burden on the government, especially in the context of economic decline and increasing budget deficits. The World Bank and International Monetary Fund (IMF) argued that the reform of the public service was required for the effective implementation of structural adjustment. However, studies have noted the contrary. Olowu (1999), argued that while public sector reforms are overdue in African countries, there is doubt whether SAPs provide a basis for comprehensive administrative reforms in the public service. The emphasis on the reduction of the size of the public service and the cuts in cost, privatization, and deregulation did not necessarily improve the efficiency and effectiveness of the public service unless attention is focused on other aspects of public sector innovation such as capacity building, and service delivery.

Since the 1990s, African countries have carried out several public sector reforms. Innovation in the public sector in some African countries has been largely driven by a succession of leadership and workforce, hence competence of leadership, dedication, and commitment to continuous administrative reform are key. As noted by Adamolekun (1999) the quality of political leadership is not only key to successful reform but also development and reducing poverty by adopting strategic policies and

programmes. According to ECA (2010), transformational leadership made a difference in Ghana, Liberia, and Rwanda. Leaders in these countries designed policies and programmes in the areas of good governance and the economy to ensure the realization of the Millennium Development Goals (MDGs), now Sustainable Development Goals (SDGs).

Several other African countries also came up with innovations and practices in their public sectors. For example, Egypt introduced an Information and Decision Support Centre. This innovation is noted for its rapid and swift response in catalyzing the establishment of a flourishing computer industry. Namibia introduced integrated coastal management with a local development planning model. Mali came with a two-pillar inter-tier resource planning initiative. While Ghana, Zambia, and Tanzania introduced the introduction of Medium-Term Expenditure Framework (MTEF) in public financial management, Tanzania's innovation was in terms of the salary supplementation scheme. Both Liberia and Sierra Leone came up with Diaspora capacity leveraging schemes and Public Expenditure Tracking Systems (PETS) in Ghana, Uganda, and Zambia by civil society organizations. Other innovations and practices in African public sectors include Namibia's National Public Private Partnership scheme for expanded waste management services in poor communities; and Rwanda's investment in the ICT sector as a driver of economic transformation and aiming to become a regional supplier of ICT-related capacity support (Olaopa 2009b). Public sector reforms featured prominently in successive development plans of Botswana and its "Vision 2016". Some of the reforms include the adoption of the Performance Management System (PMS), Work Improvement Teams (WITs), Computerized Personnel Management System (CPMS), Organization and

Methods Reviews (O & MRs), Performance Based Reward System (PBRs), and Decentralization. Ministries and departments were rationalized to improve efficiency and effectiveness delivery. Part of the reform led to the establishment of autonomous authorities which work on largely commercial principles (Olaopa 2009a).

Nigerian Experience

The public sector in Nigeria, like many African countries, was shaped by colonialism, hence, many reforms before and after colonialism were aimed at addressing diverse problems in the civil service ranging from dependency syndrome to corruption. We can summarise and categorise the civil/ public service reforms undertaken in Nigeria in three phases: Reforms undertaken during the colonial period from 1934 - 1959; Post-Independence Reforms from 1963 – 1998; (iii) Reforms under Democratic Governance 1999 – date. Given the specific focus of this paper, it has been argued that several innovations accompanied the third phase of the public sector reforms that were undertaken during the Democratic era -1999 – 2019. Upon return to democratic governance in May 1999, the civilian government met a civil service that was weak, inefficient, and characterized by poor service delivery, hence unresponsiveness towards public demands (Oyo-Ita, 2018). President Obasanjo (1999) declared that the public had declined in productivity and service delivery. Major and minor innovations and reforms include the Integrated Payroll and Personnel Information System (IPPIS) in 2007, Pension Reforms in 2004, Public Procurement Reforms from 1999, Monetisation Policy in 2003, SERVICOM Reforms in 2004, Steve Oronsaye Panel (Presidential Committee on Restructuring and Rationalisation of Federal Government Parastatals, Commissions and Agencies), Federal Civil Service Strategy and Implementation Plan 2017 – 2020 in July

2018 (National Salaries, Incomes & Wages Commission, Oyo-Ita, 2018; Oyo-Ita, 2019; Olaopa, 2008; Okorie and Onwe, 2016). We shall focus on specific innovations in public service which have contributed to service delivery. These include: the SERVICOM Initiative, IPPIS Initiative, Performance Contract, E-Governance Initiative, Medium Term Sector Strategy (MTSS), Expansion of TSA Coverage, Whistleblowing Policy (Witness Protection Bill 2019), Presidential Initiative on Continuous Audit (PICA) and establishment of Efficiency Unit.

Contributions of Public Sector Innovations to Service Delivery in Nigeria

Service Compact with all Nigerians (SERVICOM)

Service Compact otherwise known as SERVICOM is an innovative policy programme introduced by the Nigerian Federal Government in 2004 to address the challenges which often emanate from service delivery and to further strengthen effectiveness and efficiency in rendering services in the ministries, departments, and agencies of government (MDAs). The Obasanjo civilian administration 2004 introduced the policy programme out of the felt need to improve the challenges that for long were hindering qualitative and efficient service delivery in MDAs. The policy programme has aimed to ensure a strong, better alignment between government and the public, customer satisfaction, and improved utilization of resources, resulting in effective cost cutting, better management of risk, service disruption, and growth of a more secure and stable service environment, supporting change and flexibility. Even though successive administrations after Obasanjo have retained the SERVICOM, and despite the modest achievements of the initiative, poor service delivery has remained endemic in several public sectors (The Cable, March 27, 2017). More so, SERVICOM is also confronted with many challenges including

poor funding which limits the work of the body including the training of members of SERVICOM units in MDAs.

Integrated Payroll and Personnel Information System (IPPIS)

The Integrated Payroll and Personnel Information System (IPPIS) was introduced in 2007. The core objective was to reduce the cost of governance by blocking leakages, and enhancing the quality of government payroll administration (Olumide, 2015). The IPPS is a computerized and efficient human resource management information system that has been deplored by Ministries, Departments, and Agencies to undertake human resource activities from recruitment to separation including payroll and pension processing. IPPIS has recorded some achievements. According to Mr. Jonah Otunla, then Accountant-General of the Federation, the “Federal Government has saved a total of N120bn on personnel cost between 2007 and 2013 through the implementation of the Integrated Payroll and Personnel Information System” (The Punch, 2013, p.18). The efforts by the Federal government to expand IPPIS coverage to the Armed Forces, Federal Universities, and other Academic Institutions across the country have not been received by all. The Academic Staff Union of Universities (ASUU) has raised strong objections to the introduction of IPPIS and opted for University Transparency and Accountability Solution (UTAS),

Performance Contract

The Nigerian government introduced a performance contract system in its drive to improve service delivery in the public service in 2012. The performance contract is an accord linking the government and MDAs, which set up broad goals for the MDAs, put a target for evaluating performance, and provide rewards for meeting these targets (Eneanya 2013). The purpose is to advance contract services to the

populace by enhancing output, responsibility, and efficient service delivery (Eneanya 2013). As a sign of commitment to the policy, Ministers were mandated to draw mission statements, requested to set agreed goals for top priorities, and make clear their appropriations to definite services and the part to be given to each frontline component. They were to review their managerial systems in tune with the SERVICOM charter and ensure proper public service delivery, planning, and resource distribution; performance inspection and analysis; responsibility for utilisation of funds and delivery of outcomes and instituting a more valuable balance between capital and non-staffing revenue spending. To boost the scheme, Ministers were requested to go into similar contracts with Permanent Secretaries. In the same vein, Permanent Secretaries would go into contract with their directors, to cascade down to the rank-and-file involving all staff. The FGN anticipated that this initiative would be extended to States and Local Governments. Thus, the commencement of the performance contract approach to governance has made a modest contribution to service delivery in the federal civil service.

E-Government Initiative

The Nigerian government also carried out a comprehensive reform in the ICT sector. This was to further improve service delivery and improve performance management. In 2011, a new Ministry of Communication Technology (ICT) was created and in 2012 there was a review of the ICT Policy and the development of the E-Government Master Plan, followed by the launch of the Nigerian ICT roadmap 2017-2020 (BPSR, 2018). This led to the setting up of e- services portal, to have a single point of access to governmental information and services in practically every public sector in Nigeria (Eneanya, 2016). These initiatives gave birth to the establishment of ICT-enabled government services, like IPPIS, GIFMIS, Bank Verification Numbers (BVN), e-passports, e-drivers licenses, Treasury Single

Account (TSA), electronic card readers, e- tax-management, e-NYSC registration, e- land management, Geographic Information System (GIS), and so on. E-government, which aligns with the NPM theory adopted for this study has been a tool that stimulated the expansion of the private sector in Nigeria (Ashike, 2015). Thus, its application has succeeded in curbing wastage and improving efficiency in public financial management.

Establishment of an Efficiency Unit

The federal government established an 'Efficiency Unit' domiciled in the Federal Ministry of Finance in 2015. The Unit regulates public procurement procedures, and checks the internal apparatus of recurrent spending, including government exercises that promote wastage and ineptitude in MDAs. Its overarching goal is to establish a fresh custom of service delivery that encourages good organization, competence, prudence, and value for money in government services (Ashike 2015). It presents a mutual stage for MDAs to acknowledge and establish a system of good organization as part of the general cultural transformation necessary to drive the nation towards progress, especially now that the government's revenue is dwindling amongst competing demands (Ashike 2015). The establishment of an Efficiency Unit has to a large extent reduced wastages and inefficiency in public spending and has improved the level of performance in the civil service for enhanced national development.

Medium Term Sector Strategy (MTSS)

The Medium-Term Sector Strategy (MTSS) was adopted as an instrument for ensuring service delivery and public expenditure management. The MTSS is a process for connecting MDA's policies, budget, and Monitoring and Evaluation activities. It is also a tool for improving development outputs and outcomes (Ministry of Finance, Budget and National Planning, 2020). The MTSS promotes the MDAs performances management system in many ways: it keeps the financial plans

within current market realism so that the possibility of an over boated or under costing estimates are reduced; .it provides a system for preparing budgets on a 3-4years basis where the expenditure of a particular programme or projects are clearly spread over a period of its life circle called a medium term; it allows MDAs to limit their spending on available income and the choice of their plans based on their capacity. It also helps them to prioritize and sequences their projects and programme. The introduction of MTSS has contributed to improving the public financial management system in Nigeria, thereby improving the performance of public sectors in Nigeria.

These innovations, which are still evolving, were geared at improving the effectiveness of public organisations. However, they have also been criticized for being disjointed, and bedeviled with many challenges confronting public sector organisations, particularly in the 21st century, and thus requiring a co-creation approach for them to achieve the overall objective of the system's rejuvenation.

Challenges Confronting Public Sector Organizations in the 21st Century

Public sector organisations seek to achieve set goals; however, the world is ever-changing and the public sectors are under pressure to increase their ability to deliver satisfactory services to the citizens. The challenges confronting public sector organisations in the 21st century, particularly, the developing countries are diverse. Some of these major challenges are examined hereafter.

Leadership challenge

In most public sector organisations, there is no proper coordination of organisational activities by the leadership. There are few or no formal processes for conducting the innovation process. Leaders focus on budgeting, operations, and tasks, and employees may be highly skilled professionals but few of them have formal

skills in creativity or innovation. Public sector organizations may be good at initiating new projects, however, lacking innovative content. Innovation requires co-creation: open collaborative processes, iteration, active user involvement, visualization, prototyping, testing, and experimentation. Many public sector organizations leaders simply have not put into place the formal systems or built the capacity among employees that enable such processes to take place. In particular, leaders have not put into place the types of practices that may generate more innovations or sustain them.

Changing Environments and Growing Citizen's expectations

The environment in which governments operate has become increasingly unstable, calling for flexibility and adaptation skills on the part of bureaucrats and administrators in the public sector. The slow-changing environment that suited traditional public bureaucracies is less suited for the public sector organisations of the 21st century. Continuous organisational change has to become the order of the day in many parts of the public sector, driven by changes and a desire for action. The COVID-19 pandemic and economic crisis have accelerated the trend, prompting the government into making adjustments amidst constricting budgets. These turbulent changes have influenced bureaucracies in different ways, such that they now appear to be characterized by the increasing citizens' and businesses' expectations of the public sector to increase productivity and utilise taxpayers' resources as efficiently as possible. They need to gather such information and respond based on it. Pressure from citizens is growing regarding the quality of services provided, combined with the widespread perception of inefficiency and backwardness of the public sector as a whole.

Globalisation

The globalization and internationalization of business require public agencies to redefine their boundaries and cooperate across boundaries. A highly networked and interconnected world puts governments under pressure. Public sectors (education, finance, agriculture, environment, labour, etc) are increasingly being challenged by the forces of globalization. Governments are compelled to leverage innovation policy as a source of national competitiveness and public organisations themselves must identify new approaches and solutions to the new changes in the global environment. Organizations must cope with uncertainty and manage it well if they want to be effective. Uncertainty increases the risk of failure of an organization's response and makes it difficult to compute the costs and probabilities associated with alternative decisions.

Resource Constraints

There is a growing shortage of public resources, which is leading to the rethinking of service delivery, the ways that organizations function, and the degree of efficiency of the whole system. Organizations are preoccupied with the lack of material and financial resources and with the need to ensure the availability of these resources. The cuts in public spending and reduction in budgets of public organisations affect the delivery of public services and their innovative capacity to meet short- and long-term challenges.

Emerging Technologies

Technological innovations are a major driving force for new public sector solutions in areas ranging from internal administration to e-government, new educational solutions, new health care solutions, new agricultural solutions, new security solutions, and the transformation of public management in developed countries like the United States, Britain, France,

China, etc. The deployment of technologies to perform functions hitherto done by personnel has witnessed efficiency in service deliveries. These technologies perform these tasks much faster and with terrific precision and are found in virtually every front of the human discipline. They are useful in the Education Planning of a country, national security, national economic planning, sports administration, crime detection and prevention, industrial production and consumables, surveillance, and general administration. However, on the one hand, the new technologies are often costly for the government budget or reluctance by the government to appreciate the benefits of new public investments in advanced technology. On the other hand, traditional bureaucrats are either lacking capacity or reluctant to accept the benefits of new technologies. Meanwhile, citizens expect the government to deploy new technology to deliver better public service.

Politicization and lack of sustainable innovations in public sectors

Politicized public sectors are rarely attuned to innovation to make them effective organisations. Public sector organizations led by political appointees can be prone to keep and maintain power, rather than share it. Political appointees sometimes prefer short-term positive media attention over what could be the most effective long-term innovative solution. Incentives for sharing tasks and knowledge amongst public sector organisations are not very high, and internal politically motivated competition may overrule sensible collaboration. Sustaining innovations have numerous strengths, typically driving up quality and performance. They are a necessary element of nearly any organization's innovation approach and leadership is key in achieving this.

Traditionalism, Fear of Change and Anti-innovation

Public sector organisations are hardly fine-tuned innovation machines. Despite the trumpeting of ‘reinvention’ and entrepreneurship, many of them still embody the type of hierarchy and bureaucracy that private companies have been fighting to throw away since the ‘downsizing’ era of the mid-1980s. In most countries, the public sector is highly sectarianized vertically between administrative levels, and horizontally between distinct policy domains. The possibilities, and perhaps the desire, to cooperate across these divisions are not always present, despite a growing demand for coherent and ‘joined-up’ government.

Innovation Barriers faced by Public Sectors

In the public sector, there are significant barriers to innovation. This problem stems from a lack of connection between policy and practice. Practitioners face barriers to innovation including bureaucracy and the fear of risk-taking. Most people fear taking a risk, not necessarily because they are afraid of losing the taxpayers and accountability which is key in a democracy, but because of budget constraints. Moreover, the lack public service system does not reward successful risk-taking, but is quick to penalize failure. The public sector in Africa, as in several parts of the world, lacks private sector-style competition which would drive innovation. Furthermore, public sectors are more inclined to work within rules, regulations, circulars, and control, which emanate from the government. By implication, this makes innovation in service delivery to become increasingly difficult.

Innovations in Public Sector Organisations and Effective Service Delivery: Lessons from the Fourth Industrial Revolution (4IR)

The Fourth Industrial Revolution (4IR) is a term coined by Klaus Schwab. The 4IR is comparatively different from the first, second and third industrial revolutions because it is a blend of advances in artificial intelligence (AI), robotics, the Internet of Things (IoT), 3D printing, genetic engineering, quantum computing, and other forms of technologies (Wapmuk, 2021). Even though the 4IR has immense opportunities for human advancement, like every phase in the development of new technologies, it is also disruptive in nature. For example, there is the fear that the increased usage of robots in manufacturing industries will lead to the displacement of workers, which might trigger an economic crisis. Also, there is the concern that the increasing use of drones and robots for military purposes such as Close-quarters combat (CQC) or close-quarters battle (CQB) will impact on the number of personnel employed in the military as well. That notwithstanding, against the backdrop of opportunities offered by the technologies in the 4IR, the public sector organization needs to introduce certain innovations that will enable them to become effective in the 21st century. Suggestions for innovations in the public sector are made and discussed with some examples.

Use of drones

One of the most critical problems that the public sector is confronted with in Nigeria and several parts of Africa is security. Innovations in this sector tapping from the 4IR would require using drones to track kidnappers, cattle rustlers, bandits, and other forms of crime. In the medical sector, we could also use drones to deliver medicine and blood to areas that are difficult to access. For example, Rwanda introduced a fresh idea using drones. In

2016, Rwanda came up with the first initiative in the world of using drones to deliver blood. This was lifesaving. The drone, which is a combination of robotics and AI, has significantly transformed Rwanda's medical supply chain and saved many lives (Zipline n.d.). Following this example, in 2017, Tanzania, in partnership with Zipline, also launched the use of drone delivery services to provide emergency on-demand access to critical and life-saving medicines (Banker 2017; Zipline n.d.).

Using ICT and mobile technology

Several innovations can be introduced in the public sector using ICT and mobile technology. This will go a long way in enhancing service delivery. For example, we can use mobile technology to improve the agricultural sector. Mobile technology has recently been adopted to support farmers in Nigeria, Kenya and Ghana. Farmers use mobile technology to help connect farmers to information and vital services, which has helped many farmers to access quality farm input and earn more for their produce (Farmer line n.d.). Doctors also use mobile technology to consult patients and provide Medicare.

Using intelligent robots

Innovations can also be introduced by the public sector using robots for traffic control, industrial production, warfare, healthcare, etc. The Democratic Republic of the Congo (DRC) has been using a robot in form of a police officer to regulate traffic in the city since 2013. These robots, which are solar-powered, are a project developed by Women's Technology Cooperative to solve the challenges of heavy traffic in the cities of the DRC and drivers who defy traffic rules.

Using big data to respond to public concerns

Information and communications technology has enabled us to engage in critical thinking and make critical decisions

that enable us to create new ideas – innovations in the public sector. Following the outbreak of Corona Virus (COVID-19), in controlling the spread of the virus, the government had to rely on data to achieve efficient surveillance, early detection, tracing of patients' movement, isolation of patients, case management, good laboratory service, and safe and dignified burial of the dead.

Using artificial intelligence and blockchain technologies

Artificial intelligence and blockchain technologies are critical in problem-solving in the public sector in the 21st century. Blockchain technology can be used to keep track of the transactions made by its clients (farmers, entrepreneurs, etc) and uses these data to assess their ability to access loans and other financial products. For example, in the financial sector, in South Africa, MyBucks, the first Fintech business in Africa, is currently offering a broad portfolio of virtual banking products in not only African countries but also in Europe and Australia. This company utilises credit technology, supported by an in-house AI team and FinCloud software, to determine the credit history and creditworthiness of consumers.

Using open online courses to improve access to education

Mass Education through Open online courses (MEOOCs) are forms of education where a course of study is made available freely online to many participants for the overall development of society. The COVID-19 pandemic has brought to the fore the prospects for online education and at the same time a solution to a problem. Several African countries have keyed into this. Examples of universities using the online system include the National Open University of Nigeria (NOUN), the University of Lagos, the University of Cape

Town, the University of the Witwatersrand, and Stellenbosch University, etc.

Concluding Reflections: The Broader Context for Public Sector Innovation

In this paper, we argued that public sector innovation involves the introduction of new ideas that create value for society. It examined innovations and best practices in the public sector: international, continental and national experiences. The Nigerian experience reveals that innovation efforts side-by-side with public sector reforms were invigorated following Nigeria's return to democratic rule in 1999. Despite noble intentions of the innovations/reforms in the public sector to address leakages in government resources, service delivery, and inefficiency, several challenges continue to impede efforts at innovation. These include leadership, the changing environment, and growing citizens' expectations, globalization, resource constraints, challenges of embracing emerging technologies, the politicization of public sectors, and fear of change. The paper has also noted that while the 4IR comes with its disruptions, innovations, and technologies in the context of the 4IR provide room for innovations in the public sector for effective service delivery in the public sector organisations in the 21st century.

The paper notes that without navigating the innovation barriers, service delivery would remain difficult for the public sector in the 21st century. It is against this backdrop that the paper made a strong case for radical public sector innovation measures to be put in place by the public sector. This has become imperative because gradualism does not seem to be yielding the expected results for public sector innovation in African countries. Even though the paper suggested the adoption of a public sector innovation framework, it is evident that innovation capability and activity do not automatically impact performance, the wider sector conditions for innovation, play

an instrumental role. This refers to how the environment in which a public sector organization operates enables or hinders innovation. Major factors include leadership and culture, autonomy, incentives, and enablers. According to Serrat (2017), leadership vision and the spirit of innovation are important in linking innovation to strategy. The attitude of the leader and willingness to take the risk, accept new ideas, pay attention to the views of customers (citizens), and staff is also linked to prospects of innovation in a public organisation. Furthermore, the attitude of the leader to collaborate, focus on goals and provide incentives go a long way in encouraging innovation in the public sector. Autonomy pertains to the responsibility for innovation, flexibility to shape local strategy, budget flexibility, freedom to craft rules and give guidance, and legislative basis. Incentives are key in stimulating demand and competition. More so, an enabling environment for innovation cannot be over-emphasized. These include access to information, access to innovation funds and support, award schemes, tools, adequate information, and communication infrastructure, amongst others.

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