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## **A COMPLEX SYSTEMS APPROACH TO E-GOVERNANCE ADOPTION AND IMPLEMENTATION IN BAYELSA STATE, NIGERIA**

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### **ABSTRACT**

Globally, public sector innovation has become a big issue as citizens demand for greater accountability, effectiveness and efficiency in service delivery, and the liberalisation of the governance system. Debate on e-government evolved in the last decade in parallel with a broader discussion on e-governance, where the concept and practice of e-governance further encompasses the e-government phenomenon. Because of the complexities of governance and e-governance, this chapter presents e-governance as a close, large integrated, open and sociotechnical (CLIOS) framework to meet present and emerging challenges of the e-world, as well as enhance good governance for sustainability. Novel descriptions of e-governance, governance, CLIOS, complex adaptive systems, sociotechnical systems were provided from literature. From a socio-technical perspective, the design consideration for the adoption and implementation of e-governance architecture for a State in an emerging economy like Nigeria was provided.



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The contextual aspects that needed to be considered for the adoption of e-governance were discussed and citizens interface with governance through e-governance platforms were highlighted. Examples of countries implementing e-governance, benefits and challenges regarding the Bayelsa case were discussed.

**Keywords:** sociotechnical system; e-governance; complex and adaptive systems; good governance; public sector innovation; Bayelsa State; Nigeria

## 1. INTRODUCTION

Globally, advancements in technology, especially information communications technologies (ICTs) have led to an overwhelming growth in connectivity and interdependence among economic and social (as well as political) systems (WILLIAMS, 2014). Additionally, the dynamics of globalization and the rise, first of the information society, regarded as the third wave of economic transformation (HUANG; YEO; TRAUT, 2006) and later, the knowledge-based (KBE) economy, have important implications for latecomer emerging economies like Nigeria.

There are multiple drivers of the aforementioned phenomenon – one of them being the way in which society is becoming more complex and unpredictable in both positive and challenging ways (MISURACA, 2007).

The complexities are increasingly felt in the business, political, scientific, technological, health, environmental and sociocultural arenas. Similarly, the role of government in the society is undergoing fast and continuous change which appears to have accelerated in the last two decades largely due to widespread adoption of ICTs on one hand, and the growing processes of state liberalization and economic globalization on the other (MISURACA, 2012).

The emerging ICT for development approach towards public sector transformation is creating new perceptions about government and governance (GEBBA; ZAKARIA, 2012). It therefore requires governments to foster innovation by reforming their public-sector innovation systems (ROBACK, 2006).

DAVIDRAJUH (2003) supported that one objective of any government to utilize ICTs is basically to develop the economy and improve the quality of life and provide to all the citizens. Indeed, ICTs have influenced socioeconomic growth and catalyzed entire workplace cultural shifts both in the developing and developed

worlds. Consequently, governments have derived maximal benefits from adopting ICT into governance structures, resulting to governance efficiency, effectiveness of service delivery and the provision of wider information access to the governed. However, the management of technological change, that will benefit the society requires cooperation among different actor groups (ROBACK, 2006).

Misuraca (2007) said, the complexities of today's world stems from its networked nature and the growing phenomenon of the involvement of non-state or non-governmental actors into policy-making arena. The author added that such involvements assume consultative bases or by way of participatory approaches enabled by ICTs. Incidentally, governments all over the globe are adopting multifaceted approaches towards the realization of the above objectives. But here, a complex, large-scale, interconnected, open, sociotechnical (CLIOS) framework of the e-governance architecture is presented. Within the CLIOS framework, we adopt a sociotechnical systems (STS) approach to e-governance considering people and technology, two highly interconnected components of a single system as it is applicable to the study of the relationships and interactivities between the social and technical structures of e-government and e-governance. It is noteworthy that, the systems analysis approach has been used to study several civilian problems such as housing, health care, education, poverty and transportation (LARACY, 2007).

At the core of the CLIOS are the concepts of complex adaptive systems (CAS) and STS. CAS thinking has applications in several disciplines including physics, biology, economics and political science. Governance itself is said to be a complex yet universal force existing in every society (MISURACA, 2007). For example, governance as a complex system consists of other sub-systems like – socio-economic system, political system, institutional system, and organizational system, each with its inherent complexities. We thus view governance as a sociotechnical phenomenon where basic social constructs like citizen, infrastructure, team, and governance require support from ICT applications. We equally propose here that policymakers understand the 'Governance Dynamics' for effective decision making.

The liberalization of Nigeria's telecommunications sector in 2001 led to phenomenal diffusion of ICTs in several spheres and regions with diverse applications. It opened up the space for governments at all levels to adopt e-



government. Bayelsa State is one of the thirty-six states of the Federal Republic of Nigeria that was created in 1996. Being at the infancy stage of e-government has begun the adoption of e-government by establishing an E-Governance Bureau but lacked the ability for efficient diffusion to all parties involved.

The Bayelsa State government with the transformation agenda of the present state governor, the state been at the entry stage of ICT into government in digitalizing the services of the state activities to interact with and amongst government, government agencies/ministries, citizens and businesses. But unfortunately, the pace of adoption is very slow and indicates a non-ready state.

The E-Governance and Due Process Bureau (EGDB) which was established in 2009 is yet to fully comprehend the expanse of work expected to achieve for an e-ready state and for the adoption and implementation of an e-governance. The possible effect of this is that the government is yet to adhere to the principles of 'people first' using ICT technological innovations to improve service delivery to assist in the administration or management of government, and to provide services in support of government operations (VISSER; TWINOMURINZI, 2008).

The study examines the capacity of the Bayelsa State government to effectively harness ICT as an enabler in its efforts to meet present and emerging challenges of the e-world, as well as enhance good governance for sustainability. The aim will be to describe the methodology used to implement the CLIOS framework of the e-government system. Equally, while some studies have been carried out on e-governance in developing countries (AL ALTHMAY, 2012; AWAN; AMIN; KIRKBY, 2013; CHOWDHURY; SATTER, 2013; GEBBA; ZAKARIA, 2012; NKWE, 2012; MISURACA, 2007; SHAHWAN, 2010), studies looking at e-governance in developing countries from a CLIOS perspectives are rare. This chapter is intended to fill that gap.

## **2. REVIEW OF RELATED MATERIALS**

The information revolution has modified the global context in such a manner that it is so overwhelming to most developing countries who are also lacking in technological dynamism and the capacities for adapting to changes in the global socio-economic and political environment. Since the advent of computers, and more recently the internet, pressure on governments to perform better has increased, and



information and communication technologies (ICTs) have provided them with the capacity to do so via electronic (e) -government (OECD, 2003).

## **2.1. E-Government and E-Governance**

The concept of e-government is touted to have emerged against the backdrop of the global transition towards the KBE (HUANG et al., 2006). Nevertheless, CURTIN (2007) claims that, while the use of ICT in government can be traced to the 1950s, its diffusion to developing countries has been slow not until this 21<sup>st</sup> century. Luckily, the growing role of ICT in facilitating and expediting economic, social, cultural and political development is now being understood by most of developing countries (GEBBA; ZAKARIA, 2012). African governments in particular have also understood and appreciated the contribution of e-government to the government agenda (NKWE, 2012).

During the last decade, ICT has had a major influence on incrementally changing and shifting traditional and bureaucratic government models into a more accessible and transparent model, where services are delivered according to citizens' needs (AL-SHAFI; WEERAKKODY, 2010).

In this context, many countries have now transformed their traditional government processes into an e-enabled state where key services are delivered online using the ICT facilities offered by the internet. CURTIN (2007) claims that, ICTs have enabled governments to operate more effectively and transparently, providing more and better information and services to the public, and facilitates the participation of individuals, businesses and groups throughout society in their own governance.

This mode of online service delivery is commonly referred to as e-government (AL-SHAFI; WEERAKKODY, 2010; CURTIN, 2007). It characterizes efforts to use ICTs for political purposes and the organization of political activity in a country (GANT, 2008). Thus, e-government refers to the use of ICTs by government agencies at different levels to redesign and transform relations between governments and businesses, governments and citizens (G2C), different government agencies (G2G), and government to employees (G2E) (HUANG et al., 2006; KUMAR, 2011). Nevertheless, e-government differs from e-governance.

While e-governance is based on four processes – namely, electronic consultation, electronic controllership, electronic engagement and networked societal guidance – conversely, e-government refers to the structure that is responsible for electronic service delivery, electronic workflow, electronic voting and electronic productivity (AWAN et al., 2013).

But the concept of e-governance which co-evolved with e-government was initially considered the technological component of Public Administration Reform later emerged as a greater societal challenge as well as a mechanism for more than just improvement of administrative services or user satisfaction, but as something that promotes deeper forms of democracy (MISURACA, 2012).

E-governance fundamentally differs from e-government in that, it is a wider concept going beyond the simple provision of services through the use electronic mean by building an external interaction with diverse stakeholders in the external environment (AL ATHMAY, 2012).

It encompasses the utilization of ICTs to interact with and provide services to businesses, citizens and other governments with the intent to improve transparency, increase public service efficiency and deepen democracy (AWAN et al. 2013), thereby bringing about changes in the way citizens relate to governments and to each other.

Kaye (2011) cited a 2000 work of Black as broadly describing governance as the intentional activity of attempting to control, order or influence the behavior of others. Kaye therefore concluded that governance covers cover multiple actors, activities that can be enacted or carried out through a number of different mechanisms. She distinguished it from regulation that is narrower in scope and applies just to the formal structures of law and legally constituted regulatory bodies.

Misuraca (2007) provided an African perspective of e-governance that was captured within the framework of the e-Africa Initiative for Good Governance: Building e-governance capacity in African countries – it defines e-governance as: “the use of ICTs, and especially the Internet, to adopt a new conception and attitude of governing and managing where participation and efficiency are required of all the partners linked in a network: e-governance is therefore a new way of coordinating, planning, formulating and implementing decisions and operations related to



governance problems. Government can utilize e-governance to re-invent themselves, get closer to the citizenry and forge closer alliances and partnerships with diverse communities of interest, practice, expertise, conviction and inter-dependence within the context of national and international development agendas". (2007:29)

The overall process of e-governance is said to be much more complex and requires multiple factors to be taken into account (AWAN et al. 2013).

## **2.2. ICTs, Technological Change, Complex Adaptive Systems, and Sociotechnical Systems**

ICT consists of all technical means used to handle information and aid communication, ranging from computers (desktop, PC, tablets, blogs, social media, cell phones, etc.). Information technology (IT) as part of general ICT family is credited with enormous improvements in personal productivity, efficiency in communication, elimination of tedium in workplace, introduction of an element of democracy in communication across levels of hierarchy as well as creation of new modes of interaction among employees (KORUKONDA, 2012).

Likewise, by innovating the public sector with the adoption ICTs, government agencies transform relations with citizens, business and other arms of government in the delivery of services thereby supporting good governance (CHOWDURY; SATTER, 2013).

The most fruitful lesson gained by recent research is that technological change should be explored within the social fabric in which the innovative activities are actually developed and used (ARCHIBUGI; MICHIE, 1997:122). It requires an understanding of the interactions between technology and the social, ecological, economic, cultural, political and governance systems within society (MARINOVA, 2009).

Technological innovations are complex processes, involving a multitude of technological and social factors (SUURS, 2009). Technological systems (like ICT systems) consist of dynamic knowledge and competence networks (SUURS, 2009) and seem to be narrowed down to social systems.

As the society, particularly the public sector continues to innovate, pushing towards increased integration leveraging on the advances in ICT, it bridges the

communication barriers and empowers citizens to participate more actively in the governance of their countries. However, Porter (2013) claims – innovation and imagination are the stuff of great scientific, sociological, and economic breakthroughs, which is also true for governments and militaries. E-governance adoption is a part of the broader ICT innovation systems.

Therefore, like technological innovation systems, they are STS focused on the development, diffusion and use of a particular technology, in this case, ICTs, and are typically defined by their constituting structural elements (HILLMAN; NILSSON; RICKNE; MAGNUSSON. 2009).

STS include a social system, the institutional setting and the technology (BUBOU; EJIM-EZE; OKRIGWE, 2012). STS is a complex system in which social and technical sub-systems influence one another through feedback loops (HOLLNAGEI, 2002 in MAIO, 2014), producing emergent system behavior, and where the relationship between social and technical components are constantly redefined and evolve adaptively and dynamically.

It typically recognizes the interaction between people and technology, while in computer science and engineering is an approach to develop functional jointly optimized whole systems (MAIO, 2014). The resulting sociotechnical transition is the connection between governance arrangements and the functionality of the innovation system, i.e. how well the functions are served (HILLMAN et al., 2011).

Holland (1992) opined that most of the social, ecological, and biological systems that contain a large number of interacting autonomous agents can be considered as CAS as the actors or entities have adaptive capacities to the changing environment.

Complex systems embody some key characteristics critical to understanding the role of technology in the context of society (BLAIR; NIETO-GOMEZ; SITTERLE, 2013) and governance. Complex networks are referred to as 'adaptive' or 'dynamic,' because they are self-organizing; constantly changing their interrelationships based upon the needs of individual agents and environmental impacts (PORTER, 2013). This makes multi-agent approach very effective for tackling the complexity of e-governance systems (KUMAR, 2011)



BIBIKAS; KOURTESIS; PARASKAKIS; BERNARDI; SAUERMANN; APOSTOLOU et al. (2008) tension between the social and technical infrastructures can be difficult to harmonies, however. The mutual constitutive role of people and technology in society will lead to continuous negotiation procedure between these elements. Technical infrastructures affect societal behavior, while social structures shape technology's functionality.

### **2.3. E-governance is a CLIOS**

According to MISURACA (2007), based on the conceptual framework and considering that any complex issue will quite quickly bring complex issues to deal with. As earlier stated, not only the technology behind the concept is complex, governance itself is a complex phenomenon. Complex adaptive systems involving humans are said to be typically linked across a variety of arenas – diplomatic, infrastructure, and military, economic (PHISTER, 2011), social, political and cultural. In order to determine whether e-government was CLIOS or not, SEKER (2004) first of all looked at PINCH's 1987 definition of a large technological systems: "they contain messy, complex, problem-solving components; socially constructed and society shaping; contains: artefacts, groups, processes, laws, and natural resources; system components are interactive and interdependent; components are created and developed by 'system builders'". SEKER asserted further that e-government is an extremely complex system from the view of a citizen.

From SEKER's conclusion, one can adduce that e-governance which is considered even more complex than e-governance is a CLIOS as it possesses all the attributes listed in Pinch's definitions. For instance, DOSKEY; MAZZUCHI; SARKANI (2013) view the United States' Federal Government as the largest and most complex entity in the world. They maintain that complex systems and systems engineering (SE) are inextricably woven and therefore sought to identify patterns present in systems engineering activity when government organization acquire and build complex information systems.

E-governance integrates the human and the human side of technology by integrating people, processes, information, cultural, and environment in achieving the governance objectives (AL ATHMAY, 2012).

Similarly, SHAHWAN (2010) argues that e-governance should be viewed from a ‘Systems Theory’ perspective, in which it is an input that is moderated or modified by a number of variables that constitute the contextual process in the course of which other variables interact and impact this input to produce the desired output. In our case, the anticipated outputs are – good governance (transparency and accountability, inclusive development, governance efficiency and infrastructural service delivery).

MISURACA (2012) also stressed the need to take into account the complex system and self-reflective nature of intervening variables involved in social systems (MISURACA, 2012). Some such variables were listed technological change and technical infrastructure, democratic political system, good economy, effective legal system, open culture, educational system that fosters innovation, and quality manpower (SHAHWAN, 2010).

As a CLIOS, e-governance depends of ICT infrastructure which will in turn depend on availability of electricity. ICT will have to be integrated with order legacy infrastructural systems like electricity, which are in themselves complex systems. Likewise, although, electricity itself depends on certain ICT applications to functions properly, it equally depends on the energy system, specifically – availability of gas. A typical e-governance as CLIOS of Bayelsa State is shown in Figure 1.

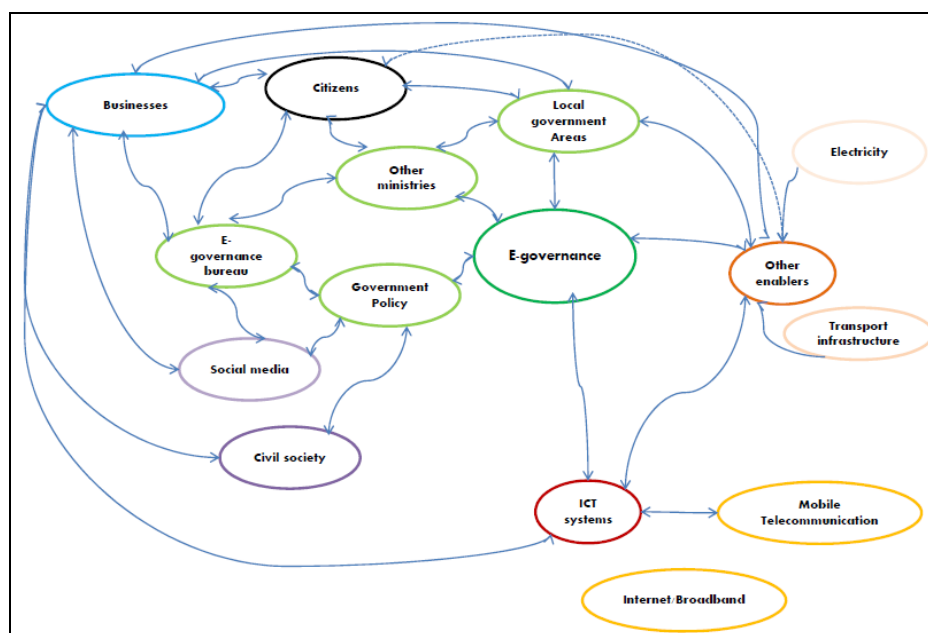


Figure 1: CLIOS representation of E-governance in Bayelsa State

### **3. BAYELSA STATE'S E-GOVERNANCE STRATEGY**

It is observed that e-government is the precursor to e-governance. It suggests that the requisite infrastructure, both human and technological has to be established alongside the institutional framework supporting it.

Buoyed by the relative success recorded at the national level, the State attempted her e-government drive. For example, Nigeria established a National Information Communication Telecommunications Policy and a National Broad Plan: 2013 – 2018. This was in addition to so many agencies set up to articulate the whole strategy of e-governance adoption in the country.

Although, Nigeria still performed poorly, ranked 141 out of the 193 countries in the United Nations E-Government Survey 2014, it is said to have made a big lift from the previous 169th position. In a bid to achieve this objective, the Bayelsa State government set up the E-Governance and Due Process Bureau through the instrumentality of the State Legislature. The State equally acquired part equity in an indigenous telecommunication company that was providing broadband internet services.

The EGDB controls the central data base providing web servicing to all ministries departments. However, local governments and nearly all the ministries are yet to have functional websites. The Bureau initiated the procurement for computers for all offices in the various ministries and started a phased training program for staff.

Pivotal in the e-governance strategy of the State is its new status as been designated as a “Smart State”. The State in collaboration with the Federal Ministry of Telecommunication has planned a massive roll-out of ICT center across the nooks and crannies of the State.

The long-term of the Smart State initiative is to make Bayelsa State a global ICT hub. Additionally, a state-wide area network (SWAN) utilizing WCDMA connectivity of the jointly owned telecoms is also planned to link up all local government areas, and government offices to a Collectorate (that is where the SWAN acts as the node) is to be established. In addition to the above SWAN, four GSM service providers already had setup transmission base stations across in all the major towns and villages of the state, except for the very remote rural communities.

### 3.1. Design Considerations

The design considerations of e-governance are as discussed below. Since the STS functionality is optimized only when there is synergy and collaboration between people, technology and the environment, tasks and processes and the whole system design must be devised taking into account the three and their interactions (MAIO, 2014).

Technology diffusion is an important determinant of the rate of success e-governance adoptions. For e-governance adoption to be useful, the contexts within which and the users' group that interface with the e-governance architecture need to be understood. Specifically, wider adoption of ICTs in Bayelsa State or any region will facilitate quick and faster adoption of e-governance.

SAHU; GUPTA; SAHOO (2004) argued that e-governance acceptance has become an issue for consideration. Referred to as the rapid diffusion of the e-governance projects, which derives actual level of uses by end-users, e-governance acceptance varies from users' group to group (and from context to context). Another factor common with complex systems is interoperability. This is the ease with which the different systems and subsystems interact with one another. Social requirements are often seen to be neglected in the process of designing and implementing organizational knowledge management solutions (BIBIKAS et al., 2008). Incidentally, most critical system failures often said to occur for "non-technical" reasons, despite flawless technical implementations, due to human (cognitive and behavioral) and socio technical factors (GIESE et al. 2009 as cited by MAIO, 2014).

### 3.2. Benefits of E-Governance

GUPTA (2004) explains that e-governance offers opportunities to transform both the mechanics of government (as in e-government) and the nature of governance itself. It equally offers new ways for improving government processes, connecting citizens and building interactions with civil society (CHOWDHURY; SATTER, 2013). E-governance has become the slice of life for citizens of most countries grappling with government policies, their implementation and finally the outcomes towards the betterment of their lives (SAHU et al., 2004).



In the developing countries, service at doorsteps through ICT is vital not only to establish a democratic and transparent government, but also to fight against poverty (CHOWDURY; SATTER, 2013). It reinforces the potential to better utilize public resources resulting in improved public service delivery, enable citizens better access services, reach out to the vulnerable parts of the population and foster open government – without losing sight of the necessary focus of efficiency and effectiveness (OECD, 2010).

For instance, in India, e-governance is one application area where IT has made considerable progress and it offers vast potential to provide good governance by enhancing transparency and reducing corruption, increasing revenue while reducing cost (both for citizens and government) (GUPTA, 2004). It is said to have made relevant improvements in many sectors using about 850 projects involving government ministries, agencies and the private sector.

The transformation of the public sector by the instrumentality of e-governance is said to serve a variety of different ends – improving interactions with business and industry, and citizen empowerment through access to information BONHAM et al (in HUANG et al., 2006). In the particular case of Bayelsa, e-governance has facilitated the procurement and tax administration processes. Citizens and businesses can quite easily process their tax documents using online platforms provided. They can also view their tax records using a unique tax identification number (TIN), using the same platform. This ease of tax administration has contributed to increase in internally generated revenues to the State. Equally, contractors and consultants to the state government can download the specified forms, fill them and forward same to the relevant ministries or extra ministerial department through the EGDB.

E-governance is also bringing improvements to maintenance of security. With the application of closed-circuit televisions which are monitored real time, activities of criminals of have been brought under control in certain trouble spots of the capital city of Yenagoa. Equally, a wider application of e-governance will be of ecological benefits, reduce the environmental footprint of the State as less hardcopy (paper) documents will be used. This will also bring in savings to the State as government spending on printing reduces.



### **3.3. Challenges of E-Governance Adoption and implementation in Bayelsa State**

In as much as countries enjoy benefits of e-governance, it is not without some glitches. More so, as it is STS, there are challenges of adoption and implementation of e-governance. For instance, different actors have different incentives and there is often a lack of agreement on what will give the most benefit (ROBACK, 2006).

VISSER; TWINOMURINZI (2008) argue that the effectiveness of e-government towards improving service delivery is littered with failure stories and despite the failures have not stopped most governments from increasingly turning to ICT, most notably internet based models, as the preferred channel for citizen-centered and business-centered service delivery.

Nonetheless, GEBBA; ZAKARIA (2012) claim, that the reliability of an e-government strategy can be the difference between success and failure of the whole effort. Hence, approaching e-governance from a CLIOS perspective will go a long way in addressing the systemic and structural challenges encumbering the adoption of e-governance in developing regions. Sometimes, failures associated with ignoring social, political, economic, and institutional elements are catastrophic (LARACY, 2007). Therefore, in most systems, functional performance depends on the interaction of people and technologies, whereby the correct functioning of systems depends largely on interactions with stakeholders (MAIO, 2014).

Again, e-governance is a relatively new concept and its implementations in developing countries are generally more problematic in comparison to those in the developed nations (CHOWDHURY; SATTER, 2013; GEBBA; ZAKARIA, 2012).

KUMAR (2011) maintains there are several types of problems in e-governance like i) interoperability and service integration within information system; ii) semantics differences related to the scattered, heterogeneous data; iii) Lack of sharing of existing data; and iv) Lack of knowledge base system in the middleware.

Also, NKWE (2012) highlighted the challenges of e-governance in Botswana to include: low level of internet penetration; telecommunications infrastructure constraints; Lack of institutional framework supporting e-government; Lack of allocated budget for e-government deployment; Digital divide; Privacy and security



concerns; Limited IT skills and training; Culture; Lack of citizen awareness and participation.

The challenges of e-governance in Bayelsa State are not different from those experienced by developing regions. They are both physical/technical to social, ranging from inadequate basic infrastructure to lack of ICT skills, illiteracy, etc. Of all the challenges, that of broadband connectivity is greatest. It has less the 20% coverage which is far cry from what is required. Another one is that of illiteracy, including technology ineptitude.

### **3.4. Possible Solutions to the Challenges of E-Governance Adoption and implementation**

AL ATHMAY (2013) enthuses that successful implementation of e-governance requires the movement from a passive information society to an active engagement of citizens. This means mass mobilization of the populace to buy-into government's initiatives of e-governance.

Again, for e-governance to be effective, SHAHWAN (2010) maintains, it has to be integrated within a holistic approach that includes a supportive and democratic leadership, a viable communication infrastructure, highly qualified personnel to operate the new technology, an open educational system that encourages innovation and creativity and a credible legal system to protect the individual against the invasion of privacy. Civil society is another stakeholder group that is strategic to the successful implementation of e-governance initiative because of their wider reach and their grassroots orientations.

### **3.5. Future research**

No doubt, e-governance has become a viable option inclusive for development. It is become more and popular with development countries and regions. Equally, the complexity of governance has been established. One phenomenon sweeping across nations is the preponderance of social media as a veritable platform for reaching out to the large population.

Governments and private persons have found it useful to interact through social media. In fact, the Bayelsa State government has a dedicated social media outfit headed by Senior Special Assistant reporting directly to the Governor. Besides the websites of the different ministries and extra-ministerial departments, the Social

Media Team collates government activities and policies and broadcasts them to the public on a regular basis. Citizens send queries through the media and get feedback in turn. We would like to propose here that policymakers understand the 'Governance Dynamics' for effective decision making.

Like STERMAN'S (2002) reference to 'business dynamics' governance dynamics should be concerned with learning in and about the complex systems of governance. It means, policymakers embrace system thinking to expand the boundaries of their mental models and develop ways to understand how the structure of complex systems creates behavior.

For a successful e-government adoption and implementation in Bayelsa State, the state will have to be e-ready and the citizens' level of technology acceptance with respect to e-governance has to be high too. Consequently, further research on e-readiness, technology acceptance levels have to be undertaken to ensure a hitch-free e-governance adoption.

#### **4. CONCLUSION**

E-governance proven to be a complex large integrated open sociotechnical system. It therefore requires multi-stakeholder engagements in order to optimize the overall system. It will mean considering non-technical issues as well as the technical infrastructure for e-governance implementation to be effective. E-governance has been adopted by many governments including developing countries in Africa with attendant benefits.

Benefits of e-governance were succinctly captured by GUPTA (2004) to include: having the potential to provide new scope (wide range of services, participation in policy making), 'substance' (increased content), 'style' (interaction) and 'stance' (attitude of government, private sector and citizens). Others include accountability and transparency, cost savings, effective service delivery and wider information dissemination and strengthening democracy. Nonetheless, adopting e-governance is not without certain challenges.

Bayelsa seems to have set the right path for her e-governance strategy. However, its impacts are yet to be felt state-wide. A lot still needs to be done. The infrastructure is not right yet. Citizens' mobilization is far way behind what can make



an effective e-governance program because the role citizens' participation in governance is crucial when trying to harness the complex social systems.

We will conclude with the words of SHAHWAN (2010) regarding the implementing e-governance, that the Bayelsa State government must reposition itself to become an engaged and constructive partner in shaping the new governance patterns that will otherwise render it rudderless. Therefore, government must produce a new culture in order to harness the enormous potential of digital government (GUPTA, 2014) for inclusive development.

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