



# **A Digital Strategy for the Government and People of Kaduna State**

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**with**

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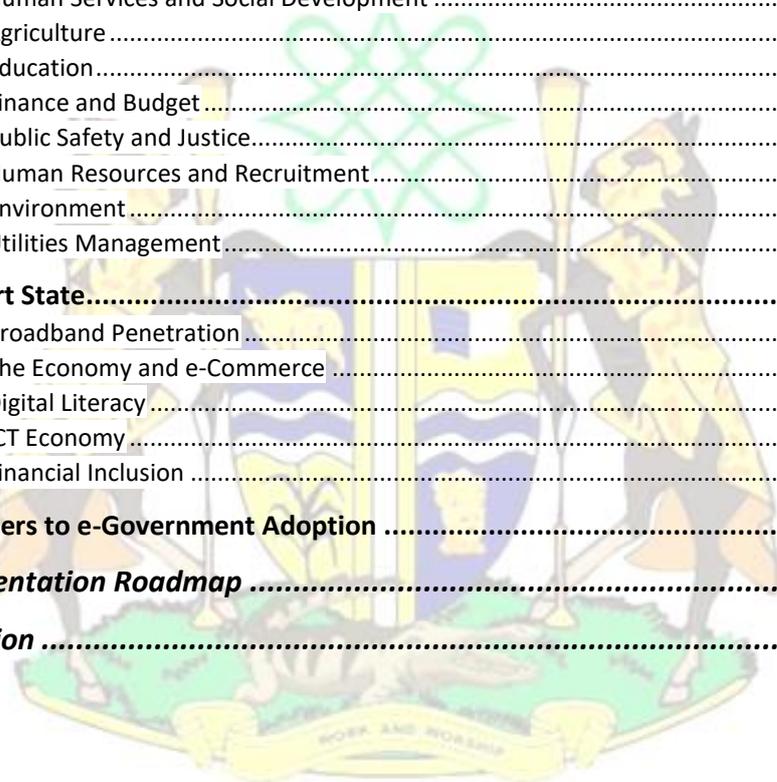
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# TABLE OF CONTENTS

<b>1: Introduction</b> .....	<b>1</b>
<b>1.1: Strategic Intent</b> .....	<b>1</b>
<b>1.2: Goals</b> .....	<b>2</b>
<b>1.3: Guiding Principles</b> .....	<b>3</b>
<b>1.4: Digital and Analog Enablers of e-Government</b> .....	<b>4</b>
<b>2: e-Government/ICT Current Position Assessment</b> .....	<b>5</b>
<b>2.1: Legal and Institutional Frameworks</b> .....	<b>5</b>
2.1.1: ICT Legal Frameworks.....	5
2.1.2: Institutional Framework.....	5
2.1.3: Capability Assessment.....	5
<b>2.2: Policy and Governance</b> .....	<b>6</b>
2.2.1: Government Enterprise Architecture.....	6
2.2.2: ICT Policies.....	6
<b>2.3: Infrastructure</b> .....	<b>6</b>
2.3.1: Government Networks and Internet.....	6
2.3.2: State-wide Broadband Penetration.....	7
2.3.3: Government Data Centre.....	7
2.3.4: Government Contact Centre.....	7
2.3.5: Devices.....	7
2.3.6: Government Data Registries (Master Data Management).....	8
<b>2.4: e-Government Services and Sectoral Initiatives</b> .....	<b>8</b>
2.4.1: Microsoft Strategic Partnership.....	8
2.4.2: BATMIS/SIFMIS Project.....	8
2.4.3: KDSG Websites.....	9
2.4.4: Electronic Voting at Local Government Council Elections.....	9
2.4.5: Ease of Doing Business Initiatives.....	9
2.4.6: Safe City Solution.....	10
2.4.7: Initiatives in Social Services.....	10
<b>3: e-Government/ICT Strategic Plan Implementation</b> .....	<b>12</b>
<b>3.1: Legal and Institutional Framework</b> .....	<b>12</b>
3.1.1: Legal Framework.....	12
3.1.2: Institutional Framework.....	13
3.1.3: ICT Skills and Capabilities.....	14
<b>3.2: Policy and Governance</b> .....	<b>15</b>
3.2.1: Government Enterprise Architecture.....	15
3.2.2: ICT Policy.....	16
3.2.3: IT Governance.....	16
3.2.4: Adoption and Change Management.....	17
3.2.5: Project Management.....	17

3.2.6: IT Security .....	18
<b>3.3: e-Government and Web-Services .....</b>	<b>19</b>
3.3.1: Government Data Registries (Master Data Management).....	19
3.3.2: Government Data Exchange (Enterprise Service Bus).....	21
3.3.3: Government Gateway .....	21
3.3.4: Website and Intranet Portal Standardisation.....	22
3.3.5: Electronic Document Management System (EDMS) .....	22
3.3.6: Modern Workplace.....	23
<b>3.4: Infrastructure .....</b>	<b>23</b>
3.4.1: e-Government/ICT Infrastructure .....	23
<b>3.5: Sectoral-related e-Government/ICT initiatives. ....</b>	<b>26</b>
3.5.1: Health .....	26
3.5.2: Human Services and Social Development .....	26
3.5.3: Agriculture.....	27
3.5.4: Education.....	27
3.5.5: Finance and Budget.....	28
3.5.6: Public Safety and Justice.....	30
3.5.7: Human Resources and Recruitment.....	32
3.5.8: Environment.....	33
3.5.9: Utilities Management.....	33
<b>3.6: Smart State.....</b>	<b>34</b>
3.6.1: Broadband Penetration .....	34
3.6.2: The Economy and e-Commerce .....	35
3.6.3: Digital Literacy .....	35
3.6.4: ICT Economy .....	36
3.6.5: Financial Inclusion .....	36
<b>3.7: Barriers to e-Government Adoption .....</b>	<b>37</b>
<b>4: Implementation Roadmap .....</b>	<b>39</b>
<b>5: Conclusion .....</b>	<b>43</b>



## LIST OF TABLES

<b>Table 1: Guiding Principles</b> .....	3
<b>Table 2: Barriers to e-Government Adoption</b> .....	38
<b>Table 3: Implementation Roadmap</b> .....	39



## LIST OF FIGURES

<b>Figure 1: Pillars for KDSG Development Plan .....</b>	<b>1</b>
<b>Figure 2: Digital and Analog Enablers of e-Government.....</b>	<b>4</b>
<b>Figure 3: e-Government Building Blocks .....</b>	<b>12</b>
<b>Figure 4: Key Digital Elements for e-Government .....</b>	<b>19</b>
<b>Figure 5: Preconditions for e-Government Solutions .....</b>	<b>37</b>



## ABBREVIATIONS

Abbreviation	Full Name
3G	Third Generation
4G	Fourth Generation
BATMIS	Budget and Treasury Management Information System
BMGF	Bill and Melinda Gates Foundation
BPR	Business Premises Registration
CAC	Corporate Affairs Commission
CCTV	Closed -Circuit Television
CIO	Chief Information Officer
CMS	Case Management System
DAR	Digital Asset Register
EA	Enterprise Architecture
ED	Economic Development
EoDB	Ease of Doing Business
EVM	Electronic Voting Machine
FIRS	Federal Inland Revenue Service
FRSC	Federal Road Safety Commission
GCC	Government Contact Centre
GDx	Government Data Exchange
GEA	Government Enterprise Architecture
HR	Human Resources
HRH	Human Resource for Health
HRMS	Human Resource Management System
ICT	Information and Communications Technology
InfoSec	Information Security
IS	Information Systems
ISP	Internet Service Provider
IT	Information Technology
KADCHMA	Kaduna State Contributory Health Management Authority
KADGIS	Kaduna State Geographic Information Service
KADIRS	Kaduna State Internal Revenue Service
KADSRRA	Kaduna State Residents Registration Agency
KADSWAC	Kaduna State Water Corporation
KASTLEA	Kaduna State Traffic and Environmental Law Enforcement Agency
KASUPDA	Kaduna State Urban Planning Development Agency
KDSG	Kaduna State Government
KKZ	Kaduna Kafanchan Zaria
MBIT	Ministry of Business Innovation and Technology
MDA	Ministries, Departments and Agencies
MDM	Master Data Management
MOJ	Ministry of Justice
NCC	Nigerian Communications Commission

NGEA	Nigerian Government Enterprise Architecture
NIMC	National Identity Management Commission
NITDA	Nigeria Information Technology Development Agency
OEM	Original Equipment Manufacturer
PMO	Project Management Office
PPP	Public Private Partnership
RoW	Right of Way
SIECOM	State Independent Electoral Commission
SJ	Security and Justice
SSO	Single Sign-On
SW	Social Welfare
TCC	Tax Clearance Certificates
TCV	Time, Cost and number of Visits
USPF	Universal Service Provision Fund
VPN	Virtual Private Network



## EXECUTIVE SUMMARY

The Kaduna State Digital Strategy has been developed to guide the application of e-government and Information Technology (IT) as a key enabler in the attainment of the objectives of the Kaduna State Development Plan.

Chapter One commences with an Introduction and seeks to establish the connection between the Development Plan and the Digital Strategy. Thus, this document details how the organised application of IT will facilitate the attainment of the objectives outlined in the Development Plan. The document then articulates the goals of the Digital Strategy as it seeks to advance all sectors of governance and the society.

A set of Guiding Principles has been identified for Kaduna state that underpin the overarching Digital Strategy. These are valid over the medium-term and may be revisited after about 3 to 5 years. It is expected that every IT initiative subscribes to these Guiding Principles to maintain coherence of the technology environment and outcomes.

IT, especially e-Government, is a journey and not a destination and like every journey it must have a point of departure. It is in this regard that Chapter Two contains a Current Position Assessment of the IT environment within the Kaduna state government and extent of penetration of e-services and infrastructure across the state. This administration has made spirited efforts in the direction of e-Government and Smart City, Kaduna. However, these have not yet yielded the desired outcome and many projects are still work-in-progress.

The actual implementation of the Digital Strategy is defined in Chapter Three by two categories of initiatives; namely those that form the Building Blocks of e-Government and the Targeted Initiatives that focus on identified sectoral objectives.

The Building Blocks include Legal and Institutional frameworks, Policy and Governance guidelines and Infrastructure development, and e-government initiatives. These cut across all segments of government and are essential for implementation of a digital government and delivery of public services.

The Targeted Initiatives refer mainly to sectoral initiatives across the various citizen and business facing facets of governance and delivery of public services. They include e-health, e-education, e-tax, etc. Each of these is built upon the frameworks, policies and infrastructure that comprise the Building Blocks.

Timelines and implementation roadmap have also been proposed for the realisation of this Strategy in Chapter Four, with a Conclusion in Chapter Five.

This Digital Strategy is successfully implemented will support the attainment of the *Vision to Make Kaduna Great Again*.

# 1: Introduction

On inception in 2015 the el-Rufai administration espoused its Vision with a simple, but deep statement - “**Let’s Make Kaduna Great Again**”.

The attainment of this Vision is propelled by a *Development Plan* as underpinned by the pillars of - **Economic Development, Social Welfare, Security and Justice, and Governance**.



*Figure 1: Pillars for KDSG Development Plan*

Information Technology (IT) especially e-Government, will play a vital role in the attainment of the objectives within these four pillars. Thus, a strategic and actionable Digital Strategy that aligns with the Government’s *Development Plan* must be developed.

This document outlines how the Government will provide data rich services that transform public administration, economy and society through initiatives and projects that create and deliver impact.

The document will focus on how to convert the longer-term vision into smaller actionable steps to make true impact in all spheres and sectors of society. The importance of the long-term vision is well recognised but must connect with the initiatives that need to take place every day. The importance of the initiatives that deliver immediate value to the users and making the digital solutions a new normality must be recognized.

## 1.1: Strategic Intent

With Information Technologies new opportunities exist for governments to be more agile and deliver more user centric and innovative services for citizens and businesses. Accordingly, the Kaduna State Government needs an integrated e-Government/ICT strategy that aligns with the four core areas in its Development Plan.

ICT has been recognised as a critical component for the successful delivery of many existing public services. This ICT Strategy will enable the Government to realize these successes and operate in a more efficient, shared and integrated manner across all of Government.

The potential for improvements through the innovative use of ICT is significant and if implemented successfully, will deliver an enhanced quality of service as well as social and economic benefits.

Given the broad range of services provided by all public institutions, this Strategy outlines guiding principles and actions that will deliver real change while creating a framework that enables the delivery of both the collective and individual needs of public institutions.

### 1.2: Goals

For Information Technology to positively impact the attainment of the objectives of the Kaduna State Development Plan the following aligned goals should be set;

1. Ensure efficient and cost-effective delivery of public services irrespective of time and place while reducing TCV (Time, Cost and number of Visits).
2. Improve government transparency and accountability while reducing corruption and running costs.
3. Produce qualitative data that will improve the quality of planning and decision-making.
4. Ensure the safety of life and property.
5. Enhance education and skills development for employability and self-employment.
6. Improve the delivery of healthcare and other related social services.
7. Grow government's revenue base, billing and collections, and reduce leakages.
8. Increase citizen participation and feedback in governance.
9. Create a smart environment that makes Kaduna the preferred destination for businesses, investors, and to live, work or play.
10. Foster entrepreneurship and innovation and grow the ICT economy of the state.

### 1.3: Guiding Principles

The following guiding principles will ensure successful implementation of this Digital Strategy:

*Table 1: Guiding Principles*

Guiding Principles	Description
Citizen Centric	<ul style="list-style-type: none"> <li>- The citizen is the centre of the e-Governance and ICT vision of the state.</li> <li>- Ensure that IT services are delivered faster and are responsive to stakeholder needs.</li> </ul>
Whole of Government Approach	<ul style="list-style-type: none"> <li>- Build a shared services platform and leverage across MDAs.</li> <li>- An integrated infrastructure will allow MDAs to collaborate and share information in order to provide new digital services for citizens and businesses.</li> <li>- Eliminate stove piping in IT projects that result in duplication of resources.</li> </ul>
Outcome Driven	<ul style="list-style-type: none"> <li>- e-Government outcomes must be clearly defined, and performance measured.</li> </ul>
PPP	<ul style="list-style-type: none"> <li>- Partnerships with the private sector should be strongly encouraged in service delivery and infrastructure build-out.</li> </ul>
Digital First	<ul style="list-style-type: none"> <li>- Continuously digitise high volume citizen and business interactions with the Public Sector.</li> <li>- Recognise that the digitisation of services, interactions and processes provides new opportunities to deliver increased efficiency through end to end digital processes and provide more effective delivery channels for citizens and businesses.</li> </ul>
Develop Capabilities	<ul style="list-style-type: none"> <li>- Ensure our people can develop and maintain the skills and capabilities to deliver excellent service.</li> <li>- Ensure that the necessary resource levels and skillsets are available through targeted recruitment and succession planning to meet the future ICT needs of the state Public Service.</li> </ul>
Regulatory Compliance	<ul style="list-style-type: none"> <li>- Ensure IT compliance with laws, regulations and contracts.</li> <li>- Recognize and assure citizens data privacy rights.</li> </ul>
Security	<ul style="list-style-type: none"> <li>- Ensure that critical and confidential information and assets are only available to those that need it and have authorisation.</li> <li>- Focus on improving ICT governance to ensure alignment, reduce risk and assure security.</li> </ul>
Value for Money	<ul style="list-style-type: none"> <li>- Enthroned a culture of cost-effective IT procurement with low administrative overheads and ensure optimal total cost of ownership of IT solutions.</li> </ul>
Data as an Enabler	<ul style="list-style-type: none"> <li>- Recognise that the governance and management of data is critical to ensuring data quality, as is the implementation of the necessary infrastructure to allow sharing of data between.</li> <li>- Facilitate better sharing of data on a whole-of-government basis to support better decision making, drive efficiency and deliver a range of new digital Government services to citizens and businesses, subject to relevant legislation.</li> </ul>

## 1.4: Digital and Analog Enablers of e-Government



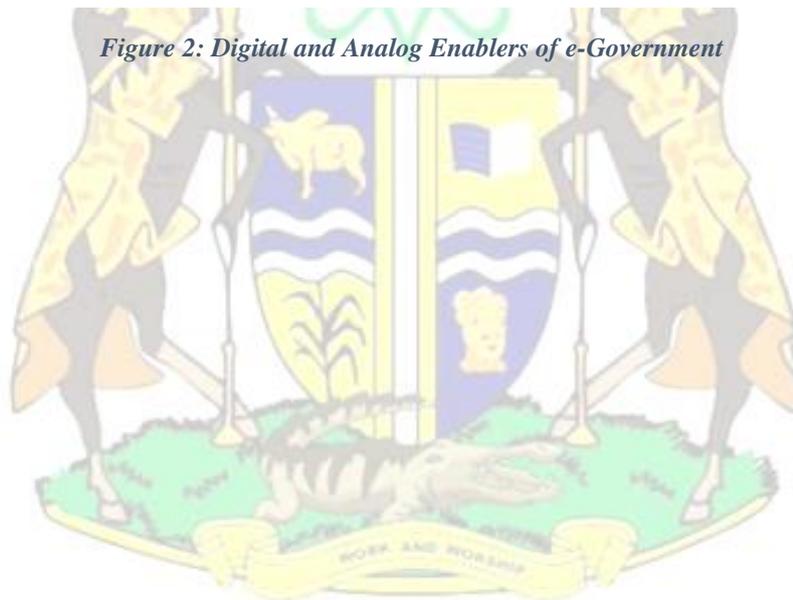
### Digital Elements

- Cyber Security
- Digital Identity
- Interoperability
- Digital Data Bases
- Sectoral Solutions
- Service Portal and Apps



### Analog Elements

- Political Will
- Fiscal Framework
- Change Management
- Sustainable Organization
- Legal Framework
- Policy and Governance



## 2: e-Government/ICT Current Position Assessment

It is necessary to evaluate the current status of Kaduna state's ICT environment. This will establish a baseline for KDSG's readiness to implement e-Government and a Smart State, while in turn establishing a foundation for future implementation. The following sub-sections contain an assessment of the current state of ICT and e-Government in Kaduna state, grouped in 4 broad categories:

1. Legal and Institutional Frameworks.
2. Policy and Governance.
3. Infrastructure.
4. e-Government Services and Sectoral Initiatives.

### 2.1: Legal and Institutional Frameworks

#### 2.1.1: ICT Legal Frameworks

There are national e-government/ICT laws, some of which are the Freedom of Information, Cybercrimes (Prohibition and Prevention) and NITDA Acts. However, Kaduna State has no specific Act relating to the purpose of e-Government and its implementation.

#### 2.1.2: Institutional Framework

KDSG has no organisation or structure for the delivery and management of IT services in the public services. A CIO was appointed in September 2019. However, there is no organisation to deliver on the operational responsibilities of the office and most MDAs in KDSG do not have any Unit/Department to provide IT support.

#### 2.1.3: Capability Assessment

Like most public institutions, there is a low-level of awareness and capability at management, technical, and user levels to support the acquisition, delivery and exploitation of ICT solutions. This has resulted in sub-optimally conceived and executed projects.

There is also a dearth of experienced and skilled IT manpower, especially at middle and senior levels. Some efforts have been made to provide training at lower levels, including 50 interns trained in various Microsoft technologies under the Microsoft Interns4Afrika program. Microsoft has also provided other smaller training courses, sometimes in collaboration with local partners.

## 2.2: Policy and Governance

### 2.2.1: Government Enterprise Architecture

An Enterprise Architecture (EA) is a conceptual blueprint that defines the structure and operation of an organization. The intent of an Enterprise Architecture is to determine how an organization can most effectively achieve its current and future objectives through a disciplined way of organising enterprise resources (business processes, data, information technologies, human etc) to provide capabilities that enable the achievement of outlined organisational functions. An Enterprise Architecture provides a strategic context for the evolution of the IT system in response to the constantly changing needs of the business environment.

Currently, KDSG has no Enterprise Architecture in place. However, NITDA has developed the Nigerian Government Enterprise Architecture (NGEA) and KDSG seeks to adapt this with support from the agency. An Enterprise Architecture expected to be produced by Microsoft for the state government as a deliverable from the Enterprise Agreement is still pending.

### 2.2.2: ICT Policies

An ICT Policy identifies the rules and procedures for the acquisition, use and disposal of IT assets and resources in an organisation by all stakeholders such as users, contractors, and other service providers. These stakeholders are expected to be familiar with these policies and the consequences relating to the violation of outlined policies. This ensures that ICT investments and operations are effective, efficient, secure, and acceptable.

As part of the Digital Advisory Services component of the Enterprise Agreement, Microsoft developed IT Strategy and Policy documents for KDSG. However, a sign-off has not been agreed between both parties as these did not initially meet expectations.

## 2.3: Infrastructure

### 2.3.1: Government Networks and Internet

A secure and pervasive government-wide network is a critical requirement for e-Government and a Modern Workplace. Currently the only government network infrastructure in place is built as part of the BATMIS project, consisting of fibre and radio connectivity covering Government House, State House, State Secretariat and nearby MDAs. However, this project is facing several issues and does not meet the requirement for a pervasive and secure Virtual Private Network (VPN) for the government.

For internet access, MDAs had a fragmented engagement of multiple ISPs. Also, connectivity and Internet access costs were bundled into IT projects, leading to unnecessary project cost increases and duplications. This situation is being addressed with an internet access project covering government offices in Kaduna metropolis being rolled out.

### 2.3.2: State-wide Broadband Penetration

Kaduna State still has many unserved and underserved communities with mobile network operators focused on deploying 3G & 4G networks only in commercially viable urban metropolises. The government has been making efforts to engage with infrastructure and service providers to expand the broadband and communication in the state. This will enhance governance, security and other aspects of society in the state.

### 2.3.3: Government Data Centre

The Government has no data centre that meets industry standards and supports multiple clients. Currently, data centres and server rooms are operated and maintained by different MDAs (e.g. KADIRS, KADGIS, and KBS data centre donated by BMGF). The key location which is the BATMIS data centre falls short of acceptable standards and has no backup location. None of the data centres or server rooms have the required manpower for running the environments.

### 2.3.4: Government Contact Centre

Similarly, the Government has no central contact centre. Several rudimentary call centres are operated and maintained by different MDAs (e.g. KADGIS, PBC Eyes and Ears project, KASUPDA, KADCHMA). Most are not based on any standard design or specifications. The functionality provided is also questionable.

### 2.3.5: Devices

There is no government-wide IT asset register for managing the acquisition, maintenance and retirement of IT equipment. The CIO's office recently undertook an IT assets audit that could only yield an approximation of the equipment in use across MDAs. Recently the government issued a directive mandating the bulk purchase of IT equipment and services based on Framework Agreements with equipment manufacturers and services providers.

There is a shortage of computing/access devices (computers and smartphones) needed for Government IT operations. However, approval has been given for the bulk procurement of

computers for public servants. Access to computing devices for civil servants and among the citizenry is required in order to enable consumption of digital services.

### 2.3.6: Government Data Registries (Master Data Management)

There is no established single source of truth for data in government. Data is captured and recorded from various sources by different MDAs, with no defined framework that allows the data to be accessed or utilised by other government systems through an API gateway or Enterprise Service Bus. There is a need for a Master Data Management System that will integrate all government data registries and enable the successful delivery of e-Government Services. This project has recently commenced.

## 2.4: e-Government Services and Sectoral Initiatives.

### 2.4.1: Microsoft Strategic Partnership

In 2017 KDSG signed a strategic Enterprise Agreement with Microsoft for delivering on e-Government and Smart City initiatives. This was comprised of software and services required for of Modern Workplace and other features of e-Government. So far:

- Exchange online implemented for email in KDSG. This had a low adoption percentage, although it is now gaining traction in the wake of the COVID-19 pandemic.
- Microsoft Office and other apps also have a low adoption with less than 30% active users.
- The use of Azure cloud services for computing, hosting and storage across government is now gaining traction and has proved quite useful.
- The value addition of Services from this agreement has been difficult to measure.
- Ministry of Local Government Affairs is deploying a Local Government HR and Payroll system using the D365 licenses contained in the Agreement.
- This Agreement is due for renewal and currently being reviewed.

### 2.4.2: BATMIS/SIFMIS Project

This ERP project was restarted in 2016 to extend coverage to all KDSG MDAs after the initial pilot phase that commenced in 2012. BATMIS is expected to automate the following functions- Payroll, Finance, Human Resources, Budgeting and Cash Management. The outcome has not met expectations and project is currently under review.

### 2.4.3: KDSG Websites

The KDSG website is primarily informative, with no interactive or transactional features. There is no common look and feel among websites of KDSG MDAs (no standardisation). Maintenance and updating of websites is often poor and irregular.

### 2.4.4: Electronic Voting at Local Government Council Elections

The Kaduna State Independent Electoral Commission (SIECOM) conducted its first electronic voting exercise in 2018. This exercise was considered a success; however, technical challenges and human errors were faced. Issues faced included devices charging faults, printer errors, and screen malfunctions. All issues were resolved before deploying the Electronic Voting Machines (EVMs) for the election exercise. Recommendations for improvement were made by the commission, which include liaising with INEC to load voters registers on to the EVMs and altering the EVM's algorithm in order to achieve more efficiency during data capture exercise.

### 2.4.5: Ease of Doing Business Initiatives

Kaduna state is determined to retain its position of 1<sup>st</sup> place in the sub-national ranking for Ease of Doing Business in Nigeria, accordingly the following automation projects have been undertaken or are ongoing;

- **KEPA Automation Project:** This involves the development and deployment of an online Portal for Kaduna Environmental Protection Agency (KEPA).
- **Ease of Doing Business Dashboard (EoDB):** This involves the development of a consolidated dashboard for monitoring EoDB KPI's domiciled in 7 MDAs (KASUPDA, KADGIS, KEPA, MBIT, KADIRS, MOJ and the Judiciary). This is currently at 50% completion.
- **Business Premises Registration:** Development of a Premises Registration system for Ministry of Business Innovation and Technology. This is currently at the deployment stage.
- **Automation of KASUPDA:** Deployment of a system for the Automation of the operations of KASUPDA is ongoing. This system will be interfaced with the KADGIS system.
- **TCC Application Processing System:** KADIRS has implemented a solution for the online processing of applications for Tax Clearance Certificates. This has been completed and is in use. This solution is among services that can be accessed through KADIRS tax portal.

### 2.4.6: Safe City Solution

KDSG has sought to implement technology-driven solutions to improve security in Kaduna state. However, outcomes have not met expectations for several reasons including lack of detailed planning and low internal capacity. These solutions include;

- Deployment IP-Surveillance system in Kaduna State, which is still ongoing.
- Implementation of Drone Surveillance, which is also ongoing.
- The status of KASTLEA's mobile traffic surveillance solution is unclear.
- MISHA operates an inter-agency contact centre with basic technology.
  - Monitoring and reporting processes are largely manual, limiting functionality.
  - A mobile app (KAD\_IR) has been developed for incident reporting. 800 downloads not impressive.
- Several international vendors have been considered for integrating and subsequently operating and managing a unified digital surveillance and monitoring platform. This is still pending.

### 2.4.7: Initiatives in Social Services

- **Health:**
  - The Kaduna State Health Supplies Management Agency has automated its supply chain from Central Stores to hospital/health centre pharmacies and dispensaries. Key features of this system are inventory management, enabling cashless operations and a robust reporting and analytics engine.
  - Barau Dikko Teaching Hospital has also implemented an EMR system for the automation of all key operations of the hospital. This is being considered among other proposals for extension to other health institutions.
  - The state Primary Healthcare Agency recently implemented a rudimentary Human Resource for Health (HRH) database of health workers.
  - The ministry of Health requires a common platform for medical records and disease reporting.
- **Education:**
  - The Student Loans and Scholarship Board has achieved full automation of the scholarship application process.
  - A PPP agreement has been approved for the implementation of an Education Management Information system across the state's tertiary education institutions.
  - The Schools Quality Assurance Authority is currently working with the CIO towards automating its key functions.
  - The process of acquiring systems and e-learning solutions for 16 model schools is still ongoing and several proposals are being reviewed.

### 2.4.8: E-Judiciary Initiatives

The state judiciary embarked on the automation of the operations high court in 2016/17, however this project has not been completed and faced challenges with lack of ownership. Documentation relating to the scope and detailed operational deliverables are not available. The Attorney General and Chief Information Officer have engaged the Chief Judge and Chief Registrar with the objective of supporting the completion of the project and procurement of the balance of the equipment is currently ongoing.

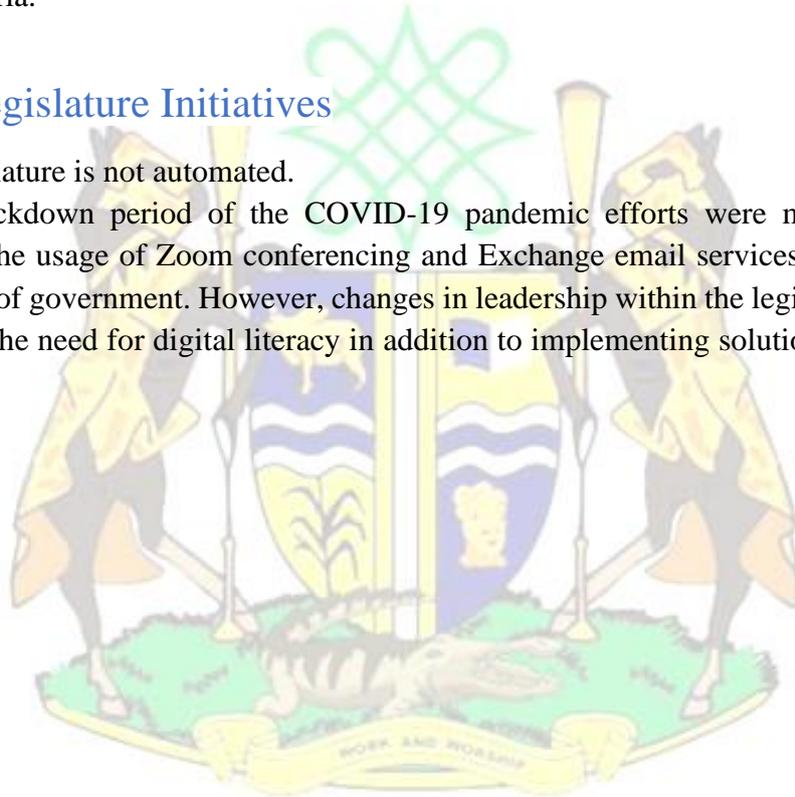
The coronavirus pandemic has also created global awareness of the need to amend legislation to enable virtual courtroom sittings and enable activities to be delivered online.

Automation of the judiciary enables the attainment of one of the key indicators of the Ease of Doing Business ranking with Kaduna seeks to retain its 1<sup>st</sup> place ranking in the sub-national index for Nigeria.

### 2.4.9: E-Legislature Initiatives

The state legislature is not automated.

During the lockdown period of the COVID-19 pandemic efforts were made include the legislature in the usage of Zoom conferencing and Exchange email services procured by the executive arm of government. However, changes in leadership within the legislator stalled this engagement. The need for digital literacy in addition to implementing solutions has also been observed.



## 3: e-Government/ICT Master Plan Implementation

Considering that various e-Government related projects are being pursued by different MDAs with constraints in funding and skillsets, the successful and sustainable implementation of e-Government must be built upon a strategic Whole-of-Government approach.

An e-Government Strategy having the following thrusts has been defined for the attainment of the goals outlined in Section 1;

- Establish Legal and Institutional Frameworks.
- Establish Policy and Governance Guidelines.
- Build Infrastructure for secure Digital Services.
- Design and Deploy e-Government Services and Sectoral Initiatives.

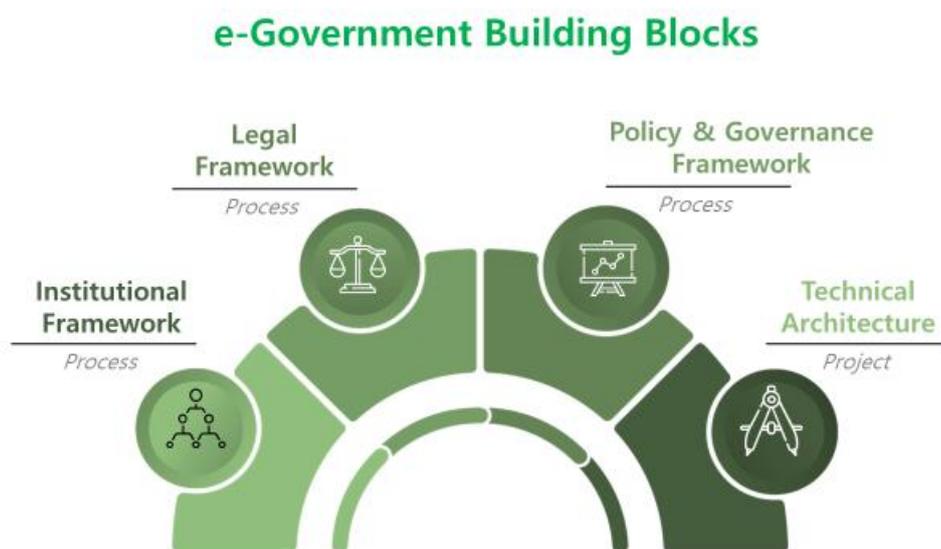


Figure 3: e-Government Building Blocks

### 3.1: Legal and Institutional Framework

#### 3.1.1: Legal Framework

It is essential to have a legal framework for e-Government and ICT in Kaduna State and these include; a law necessary for the establishment of an organisation with responsibility for e-Government/IT in the public sector, general laws for an information society and specific laws enabling the delivery of digital services by MDAs.

- **Actions:**
  - Enact a law for the establishment of an organisation responsible for e-Government and IT in the public sector.
  - Identify and domesticate in Kaduna State all relevant ICT related laws of the Federation of Nigeria.
  - Enact or amend such laws, regulations, and guidelines required for e-Government and ICT use in Kaduna State.
- **Expected Benefits**
  - Establish a legal entity for the sustainable coordination and delivery of ICT services in the Kaduna state government.
  - Ensure safety and reliability of Information Systems and Digital Services.
  - Increase innovation, efficiency, and productivity in government services.
  - Protection of personal information and privacy.
  - Expansion of public disclosure and access to administrative information.
  - Improve accessibility of e-Government services.

### 3.1.2: Institutional Framework

- **Actions:**
  - Establish an IT organization with mandate, funding, and human resources needed to sustainably drive e-Government and ICT in Kaduna State. This will be headed by the CIO.
  - The organization will be responsible for strategy, policy, and governance, project implementation and operational service delivery. Support functions/departments will also exist e.g. HR, Finance, and Admin.
  - Set-up ICT Divisions/Departments in key MDAs or clusters to be resourced from the IT organization. This will ensure alignment and discourage stove-piping.
  - Provide incentives that will attract IT professional and talent.
  - Create a Governor's ICT Advisory Council that will periodically engage with the governor to advise the state on ICT to boost the socio-economic development of Kaduna state.
- **Service Delivery Strategy:**
  - Delivery of ICT services will be based on a Blended Model comprising of inhouse staff and third-party vendors, preferably in-state, to provide ICT management and support services.
  - All transversal projects e.g. networks and email will be domiciled at the IT organization. However, e-Government Services should be developed by the owner MDAs, e.g. e-Health, under guidance and project management of the IT organization.

- **Funding Strategy:** guidelines for capital and recurrent expenditure
  - International best practice recommends a provision of 1-3% of Government's capital budget for e-government and IT initiatives. This should be legislated into the Act establishing the organization.
  - All IT projects must have provision for recurrent expenditure components at inception.
  - MDAs should develop annual IT budgets under guidance from the CIO's office and jointly presented to the PBC.
- **Expected Benefits**
  - Provide strategic leadership and services that align with KDSG's Development Plan.
  - Ensure efficient and cost-effective deployment of IT services and initiatives in Kaduna State.
  - Ensure the adoption of world-class standards and practices in the use of IT.
  - Foster IT interoperability and collaboration among MDAs.
  - Eliminate friction and competition between MDAs and the ICT team.
  - Ensure that Kaduna state attains a leading position as a digitally friendly sub-national government within Nigeria and the region.

### 3.1.3: ICT Skills and Capabilities

For successful e-Government in Kaduna state, relevant skills and capabilities must be built at all levels, from the leadership in government, through the public service, to consumers of e-Government services. A vital consideration should be that when leaders think about investing in technology, they should first think about investing in the people who can make that technology useful. To achieve this digital literacy strategy programmes and initiatives must be designed to match the requirements of stakeholders in relation to their functional interaction with e-Government services.

- **Actions:**
  - Develop a digital literacy strategy that identifies training needs and requirements for all e-Government stakeholders (e.g. leaders, civil servants, citizens, etc).
  - Professionalise the ICT career streams to allow progression within the ICT cadre in the civil service
  - Identify training institutions and programs that can cater for training needs and requirements of civil servants.
  - Encourage Public Private Partnerships (PPP) for ICT/e-Government training initiatives.
  - Develop rewards systems for skill recognition among government officials and citizens to encourage ICT adoption, while instituting digital literacy as a prerequisite for career advancement in the civil service.

- **Expected Benefits**

- Provision of high-quality ICT professional services through ICT capability development.
- Provision of career development opportunities for ICT professionals.
- Improve quality of decision making in ICT investments and deployments.
- Reduce digital divide and resistance from staff of MDAs.
- Increase citizen participation in the governance process.
- Improve KDSG's partnership with the Private Sector.

## 3.2: Policy and Governance

### 3.2.1: Government Enterprise Architecture

Government Enterprise Architecture (GEA) is a hierarchical approach for aligning business and ICT by integrating the Information Systems (IS), processes, organisational units, and people in the government.

GEA will help KDSG align IT to its governance plan using industry standard guidelines and best practices. These will in turn allow the integration of interoperable IT systems across all MDAs and public services.

- **Actions:**

- Develop a GEA for deploying IT systems and services across the government enterprise and within MDAs. This will enable collaboration, exchange, and use of data among MDAs in a standardised manner.

- **Expected Benefits:**

- Align all IT initiatives in all MDAs to the overall KDSG enterprise architecture for standardisation.
- Improve interoperability and collaboration across MDAs through the delivery of seamless, sustainable, and scalable IT systems and services.
- Reducing duplication of effort and resources relating to the use of IT.
- Develop common specifications and standards for the procurement of IT in order to reduce cost and delivery time.
- Support the identification of opportunities for IT development and provide a roadmap for actionable and sustainable implementation of IT initiatives across Kaduna State.

### 3.2.2: ICT Policy

The CIO's office will develop IT Policy documents that guide users in the responsible use of IT resources, ensure data protection, and optimise skillsets. When designed, the policies will be updated regularly in line with evolving industry standards developments.

- **Actions:**
  - Develop an IT policy document with a clear scope that covers areas such as security, hardware, software, support services, data management etc.
  - Provide guidelines for how the IT policy should be deployed, with specific, action-oriented descriptions and step-by-step procedures placed alongside at-a-glance overviews for quick scanning.
  - Update the IT policy regularly.
- **Expected Benefits**
  - Educate digital service administrators and users on security related matters.
  - Improve IT compliance and security.
  - Improve accountability.
  - Ensure efficient and effective use of IT resources.

### 3.2.3: IT Governance

IT Governance is an integral part of overall Enterprise Governance. It is a prescribed framework that provides a structure for organizations to ensure that IT investments support business objectives. By following a formal framework, organizations can produce measurable results toward achieving their strategies and goals. Organizations implement a formal IT governance program that provides a framework of best practices and controls.

- **Actions:**
  - Identify and adopt industry standard IT Governance frameworks such as ITIL, COBIT, ISO27001, CMMI, PRINCE2, etc. for Service Management, Information Security, and Project Management, etc.
  - Train and certify IT support staff in ITIL.
- **Expected Benefits**
  - Ensure 24 x 7 service availability that is a prerequisite for e-Government.
  - Implement and operate an IT environment that is supportive of users and systems.
  - Ensure that KDSG meets the regulations governing the protection of confidential information, financial accountability, data retention and disaster recovery, among others.

- Ensure KDSG maintains professionalism by meeting internal and external requirements that are based on industry best practices and controls.

### 3.2.4: Adoption and Change Management

Adoption and Change Management is a critical factor for the success of e-Government and ICT use in Kaduna State. It serves as a starting point for the behavioural change that is needed for both citizens, businesses and public servants, creating the foundation for understanding and ultimately support for the new environment created by e-Government/ICT.

- **Actions:**

Develop an overarching strategy that includes:

- Organising ICT conferences and workshops for ICT professionals and non-professionals.
- Encouraging private sector collaborations that improves public awareness of ICT such as ICT fairs and exhibitions.
- Driving adoption in government by securing the buy-in and active support of government leadership and key functionaries.
- Digitize internal information and processes that are commonly accessed and executed by public servants
- Digitizing commonly government services and processes that are commonly accessed by the citizenry and businesses.

- **Expected Benefits**

- Reduce digital divide.
- Increase the adoption and use of digital services in Kaduna State.
- Increase citizen participation in the governance process.
- Improve citizen and business access to government services.

### 3.2.5: Project Management

As the government focuses on e-Government a professional and standardised approach to IT Project Management is required. This will ensure successful project outcomes from initiation, implementation, and continued use.

- **Actions:**

- Adopt a project management framework that covers key areas such as planning, initiation, management and mainstreaming of projects.
- Create a Project Management Office (PMO) to be responsible for coordinating all IT projects in KDSG, from procurement to completion/handover.
- Provide role-based training for staff involved in IT project delivery.

- **Expected Benefits**

- Reduce time, visit and cost for project monitoring and evaluation.
- Improve capacity to monitor and evaluate projects with proactive risk management and quality management.
- Provide project management scheme aligned with budget and improve expenditure management.
- Reduce corruption as well as improve transparency and accountability based on correct information and traceable project information.

### 3.2.6: IT Security

Information Security (InfoSec) is a fundamental element for the successful deployment and adoption of e-Government. InfoSec cuts across all aspects of the e-Government ecosystem, including attitudes of users and administrators of digital services, policies, device management etc. Hence, KDSG must use the appropriate means to ensure that all IT infrastructure and services are highly secured and available 24/7.

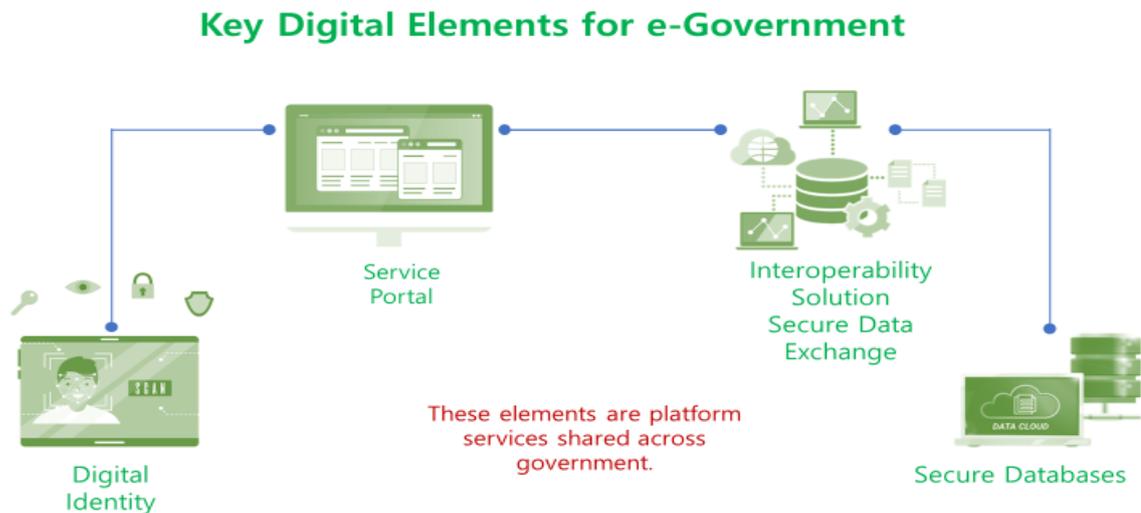
- **Actions:**

- Ensure that all systems and services are secured by design.
- Develop security policies and guidelines that govern the use of e-Government services and infrastructure.
- Conduct regular IT security audit for systems and infrastructure.
- Educate digital service administrators and users on security related matters.
- Commence the processes necessary for the attainment of ISO27001 certification for information security by the government.

- **Expected Benefits**

- Secure the state against financial and reputational breaches arising from security breaches.
- Ensure the safety of information that is captured and exchanged on all e-Government platforms in Kaduna State.
- Increase citizens trust in digital services.
- Ensure the availability of digital services 24/7.

### 3.3: e-Government and Web-Services



*Figure 4: Key Digital Elements for e-Government*

#### 3.3.1: Government Data Registries (Master Data Management)

A Standardised state-wide Master Data Management System that integrates data registries across different MDAs is essential in order for KDSG to deliver Digital Services to citizens and businesses in a convenient, safe, and effective manner across its various sectors.

##### I. Digital Identity System

The system provides services regarding resident registration and identification which are directly related to everyday life.

- **Actions:**
  - Commence implementation of Digital Identity system for KADSRRA.
  - KADSRRA to determine operating model and partnership(s) framework.
  - Develop master data architecture for KDSG.
  - Issuance of resident ID cards.
- **Expected Benefits**
  - Provide fast and transparent public service based on the identity information of citizens.
  - Provide customised, efficient, and equitable social public services due to the identification of personal information.
  - Increase synergy among KDSG MDAs that require the use of personal information.
  - Save time and cost of governance and public service provision.

## II. Land Management System

The land management system will improve existing land-related services through the delivery of a citizen and business centric land management service.

- **Actions:**
  - Claim full control and ownership of land database, administrative privileges and other related services.
  - Deploy digital services based on an integrated land management system.
  - Improve Cadastral Information Network and Integration.
- **Expected Benefits**
  - Improve service delivery in land administrative services by eliminating corruption, reducing disputes/litigation, and ensuring transparency and accountability.
  - Increase administrative efficiency by reducing the time, number of visits, and cost to get land-related services for citizens and business.
  - Increase IGR for KDSG.

## III. Business Premises Registration System (BPR)

The Business Premises Registration System will improve existing business-related services by delivering effective and efficient business centric services, through data driven decision decision-making based on Kaduna State's economic environment.

- **Actions:**
  - Deploy an integrated Business Premises Registration (BPR) system.
  - Build an interface between the BPR and other state platforms with the CAC (Corporate Affairs Commission) platform.
- **Expected Benefits**
  - Simplify processes related to businesses such as premises registration, trade license application, and corporate tax monitoring.
  - Provision of digital services to businesses in a customer centric manner.
  - Attract an increase in business investment in Kaduna State through ease of doing business.

## IV. Vehicle Registration System

An integrated vehicle licensing management system will store information of vehicles and car owners in Kaduna State. This will enable process simplification and standardisation for issuing of vehicle licenses and certificates in an efficient and effective manner.

- **Actions:**
  - Deploy a portal through the government gateway that allows for the registration and payment for vehicle licenses and certificates.
  - Interface with Digital Identity and other data repositories

- **Expected Benefits**

- Enhanced security and reduction of vehicle related crimes.
- Ease the tracking of vehicle license and certificate status.
- Increase IGR for KDSG.

#### V. **Interfacing with Federal Government Systems**

The Master Data Management System should also interface with federal government systems that store crucial data such as:

- NIMC's national identity database.
- CAC database.
- FIRS database.
- FRSC's drivers' license database.

### 3.3.2: Government Data Exchange (Enterprise Service Bus)

KDSG requires a Government Data Exchange (GDx) that allows the exchange of data between government systems as another fundamental component in the e-Government environment. This is a fundamental requirement of any e-government strategy.

- **Actions:**

- Implement a GDx based on Enterprise Service Bus that is securely coupled to the Government Gateway, Master Data Management System (MDM), and Data Registries.

- **Expected Benefits**

- Provides a single source of truth across different systems.
- Serves as a potential means for revenue generation.
- Enhances citizens and business convenience.
- Improves security and accessibility of government services.

### 3.3.3: Government Gateway

The KDSG Gateway portal will be a single window makes websites from all MDAs and major digital services available to the public. This will provide efficient services to citizens and businesses, while simplifying administrative processes and integrating cross-agency relations. The Government Gateway portal is underpinned by the Enterprise Service Bus.

- **Actions:**

- Deploy KDSG Gateway incorporating Enterprise Service Bus.
- Implement and incorporate secure e-Payment Gateway.
- Deploy Digital Services with personalised portal through Single Sign-On.

- **Expected Benefits**

- Increase transparency, accountability and responsiveness of government administration.
- Reduce cost, time and number of visits for government-related services and information.
- Deliver improved services and benefits in a more effective and efficient manner.
- Improve standard of living in Kaduna State through open access to information and services.

### 3.3.4: Website and Intranet Portal Standardisation

All MDA websites and Intranet Portals will be redesigned to have a standardised design template and common feel that will ease navigation, increase trustworthiness, and improve online interaction.

- **Actions:**

- Design and deploy a standardised template for all MDA websites and portals.
- All websites belonging to MDAs must have a common look and feel.
- 5 consultants/contractors will be engaged for the design and deployment of websites across MDAs

- **Expected Benefits**

- Increase online interaction and access to information.
- Ease the navigation and search for information on government websites.
- Improve trustworthiness of online information.

### 3.3.5: Electronic Document Management System (EDMS)

KDSG requires an EDMS that allows the management and exchange of documents between government systems as another fundamental component in the e-Government environment. This is a fundamental requirement of any e-government strategy as it will ensure the availability, security and accessibility of documents.

- **Actions:**

- Implement an EDMS that would allow the management and exchange of documents efficiently and effectively.
- Establish a Document Digitisation Bureau to serve as a central service for the scanning, indexing, and archiving for historical documents across KDSG MDAs.

- **Expected Benefits**

- Ensures the security and longevity of documents.
- Improve the management and accessibility of documents.
- Creates meaningful entry level employment for youth.

### 3.3.6: Modern Workplace

A *Modern Workplace* is a digital and physical space that meets the automation and collaboration needs of organisations and individuals. There is a need for KDSG to continuously design and deploy Modern Workplace strategies and applications to eliminate day-to-day working environment challenges.

- **Actions:**
  - Design and deploy strategies and applications to support Modern Workplace initiatives across all MDAs.
  - Implement government-wide messaging and collaboration.
  - Implement employee self-service for access to information and basic workflow processes.
  - Enable secure mobile computing.
- **Expected Benefits**
  - Improve workforce productivity.
  - Increase workplace and document security.
  - Improve document storage and retrieval.
  - Increase employee satisfaction.
  - Drive operational excellence.
  - Enhance collaboration between various organs of the Government.

## 3.4: Infrastructure

### 3.4.1: e-Government/ICT Infrastructure

There is a need to design and deploy KDSG's IT infrastructure in order to lay a strong foundation for the provision and seamless delivery of digital services.

#### I. Government Network

A government Virtual Private Network (VPN) will provide KDSG and its stakeholders access to secure and reliable online services. The current network in the state needs to be redesigned based on industry standard architecture. Also, all MDAs and online services should be connected to the government-wide network.

- **Actions:**
  - Extend network connectivity to all MDAs and public services.
  - Implement separation between public Internet and Intranet services.
  - Attract private sector partnership and participation in the improvement of network infrastructure.

- **Expected Benefits**

- Provide accelerated support for the implementation of e-Government initiatives that are aligned with KDSG's governance plan.
- Improve government, citizens, and business access to digital services that will improve standards of living.
- Blended support model will assure quality of service and also grow IT economy of Kaduna state by giving local companies the opportunity to provide services to Kaduna state government.

## II. Government Data Centre

A state-wide integrated Data Centre will provide 24/7 credible, efficient, and secure digital services to government, citizens, and businesses in Kaduna state. To ensure this happens successfully, the state's silo Data Centres must be consolidated into one integrated Data Centre.

- **Actions:**

- Build a Data Centre (DC) at a minimum T-2+ standard with capacity to serve all KDSG MDAs.
- Consolidate silo Data Centres into a central integrated data centre with Cloud technology features.
- The management of the DC will be based on a blended model of inhouse resources and 3<sup>rd</sup> party solution providers.

- **Expected Benefits**

- Provide a high-performance integrated Data Centre for operating and managing information services and resources for KDSG.
- Provide an exclusive and modularised platform for communication between digital services across MDAs.
- Reduce cost implication related to Data Centre services and management.
- Provide a stable IT-based government services that ensures Business Continuity even in the event of a disaster.

## III. Government Contact Centre

A state-wide integrated Contact Centre will provide 24/7 accurate and actionable information and support services to citizens and businesses in Kaduna State.

- **Actions:**

- Build a single omni-channel (multiple access) Government Contact Centre GCC to serve all the MDAs of KDSG for service delivery to citizens, businesses and government employees.
- Consolidate silo Contact Centres operated by multiple MDAs into a central integrated Contact Centre.
- The management of the GCC will be based on a blended model of inhouse resources and 3<sup>rd</sup> party solution providers.

- **Expected Benefits**

- Provide accurate and faster information to citizens and businesses with improved professionalism.
- Improve interagency collaboration for better service delivery.
- Reduce cost implication related to Contact Centre services and management.
- Provide government with data on issues relating to public services and state-wide issues collated from the contact centre.

#### IV. Devices

Procurement and distribution of devices within MDAs will improve adoption, administration, and continued delivery of digital services to citizens and business. An increase in number of device usage by both government administrators and citizens can translate into an increased access to digital services offered by KDSG.

- **Actions:**

- Increase the number of devices in circulation and use through strategic procurement and distribution.
- Standardise on the configuration of all devices to be procured by KDSG
- Procurement will be handled in bulk based on Framework Agreements with OEMs or nominated representatives.
- Implement an asset management process for the acquisition and lifecycle management of all technology in Government.

- **Expected Benefits**

- Increase the adoption, administration, and use of digital service.
- Provide accurate and faster information to citizens and businesses with improved professionalism.
- Save time and cost of governance and public service provision.

#### V. Digital Assets Register

A Digital Assets Register (DAR) will allow KDSG collect and keep records of all procured and distributed assets within its MDAs. This will improve decision-making and planning relating to the procurement and retirement of devices.

- **Actions:**

- Deploy a DAR that allows for the capture and cataloguing of all government assets.
- The DAR will have features and administrative dashboards that will allow MDAs key in information regarding assets based on a standardised set of policies and procedures.

- **Expected Benefits**

- Improved tracking of assets within MDAs.
- Improved decision-making regarding procurement and disposal of assets.
- Improved efficiency and transparency in asset management related activities.

## 3.5: Sectoral-related e-Government/ICT initiatives.

### 3.5.1: Health

#### I. Integrated Health Management and Hospital Information System

Automation of the healthcare sector processes and services using an Integrated Health Management and Hospital Information System will not only enhance efficiency of the hospitals but will also optimise the use of resources like medicine, manpower, equipment, and records.

- **Actions:**

- Develop an Enterprise Architecture framework for the Health sector to govern the design and deployment of solutions within this sector and align with the Government Enterprise Architecture.

- Deploy an Integrated Health Management and Hospital Information System across all hospitals and healthcare facilities in Kaduna State that has various modules such as bed management, patient records, staff records, drug administration and inventory management etc.

- Ensure compliance and full use of deployed healthcare systems across Kaduna State.

- The need for Telemedicine services has been further emphasised by the COVID-19 pandemic as certain symptoms and ailments should be diagnosed and treated without hospital visits.

- **Expected Benefits**

- Improve healthcare service delivery to citizens.

- Reduce government spending in the healthcare sector.

- Increase and improve healthcare research and exchange of information.

- Enhance equitable and accessible basic health services beyond state and national boundaries.

- Save more lives.

### 3.5.2: Human Services and Social Development

#### I. Social Development Platform

An integrated social Development Platform will provide Kaduna State citizens with a one-stop service platform that cuts across all social Development initiatives provided by the Ministry of Human Services and Social Development. The system should be integrated with the Kaduna State resident ID and other necessary information in order to allow adequate and efficient management of Human Develop and Social Services matters in the state.

- **Actions:**

- Deploy an Integrated Social Development Platform with modules such as Social Development Service Management, Social Development Facility Management,

Integrated Social Development Database (with registration information from Youth Clubs, NGOs, Cooperative Societies etc), Online Payments, and Analytics and Reporting.

- The Integrated Social Development Platform will interface with other online government platforms such as the Digital Identity Platform, so as to increase efficiency and service delivery.
- **Expected Benefits**
  - Improve KDGS's reach to those who need Social Development interventions and reduce the blind spot of Social Development.
  - Improve quality of service to marginalized or disadvantaged people.
  - Reduce the level of corruption related to social development intervention initiatives in the state.
  - Allow KDSG to make strategic developmental decisions based on real time data captured from the Social Development Platform.

### 3.5.3: Agriculture

#### I. Agriculture Information System

There is a need for an Agricultural Information System that will provide total services ranging from planning to sales of agricultural produce/commodities for both information and consultation purposes. Also, it should provide innovative marketplace services for wholesalers and retailers involved in the agricultural business.

- **Actions:**
  - Deploy a System that provides total digital services from planning to sales of produce/commodities.
  - System should also have modules such as Cultivation Calendar, Control Calendar, Growth Model etc.
- **Expected Benefits**
  - Increase productivity, sales and profits in the agricultural sector.
  - Minimize agricultural risk and damages through the fast provision of information and guidance to Agric-sector stakeholders e.g. information about blight and harmful insects and natural disasters.

### 3.5.4: Education

#### I. Integrated Education Information System

An Integrated State-wide Education Information System framework is necessary in order to provide better services from primary education through to tertiary education in more tailored manner. The systems should consist of services for students, parents, and educational administrators. This will enhance the quality of education and academic research in the state, while providing an opportunity for every citizen to

develop capacity and reduce the knowledge and information in the state. The COVID-19 pandemic has raised the urgency for online learning solutions.

- **Actions:**

- Deploy an Integrated Education Information System with modules such as Teacher Information Management, Student Information Management, School Information Management, Monitoring and Reporting, Statistics and Analysis.

- Digital content development – convert all existing hard copy content into digital format and ensure that all new material is digital from origination. Learning material should be digital and amenable to interactive online delivery.

- Digital access - identify and progressively implement scalable and cost-effective partnerships for the acquisition of access devices, computers and smartphones, for teachers and learners, and extension of broadband connectivity to all schools.

- Achieve 100% digital literacy for all teachers and education administrators by 2022

- Develop policies and guidelines for the Education sector that govern access and consumption of online content by students.

- **Expected Benefits**

- Improve overall quality of education by securing records of students and teachers and providing adequate education based on real-time data.

- Increase student school attendance and graduation from primary education to higher education.

- Provide data and support policymaking based on statistics and analytical data.

### 3.5.5: Finance and Budget

#### I. Integrated Budget and Accounting System

There is a need for an Integrated Budget and Accounting System in order to improve finance and budget-related activities in Kaduna State. The system should be integrated with other systems used across all MDAs in the state that share common services and business-related processes.

- **Actions:**

- Deploy an Integrated Budget and Accounting System with modules such as Budget Implementation Module, Financial Asset Management, Advanced Financial Reporting and day-to-day Management Reporting.

- The BATMIS/SIFMIS system is currently being reviewed the outcome is expected to meet the operational expectations.

- Implement BATMIS in MDAs for end-to-end online processing.

- **Expected Benefits**

- Improve functions for budget preparation, budget execution and budget implementation.

- Reduce time and increase accountability for financial reporting.

- Enable to measurement of performance against budget and improve efficiency of strategic budget preparation.
- Reduce leakages, increase transparency and accountability.

## II. e-Procurement System

An e-Procurement system will enable KDSG ensure and achieve efficient, effective and transparent management of public resources. All stages of procurement, such as bidding, awarding contracts, contracting, delivery, and payment, will be handled online, and procurement progress can be monitored in real-time. All registered companies will be able to participate in biddings advertised by KDSG through a single registration process via the e-Procurement System.

### • **Actions:**

- Deploy an e-Procurement System with modules such as centralised registration, workflow automation, e-Tendering (e-Publishing/e-Advertisement, e-Lodgement, e-Evaluation, e-Contract award), Digital Signature etc.
- The Government is implementing World Bank funded e-Government Procurement Software as a Service (e-GP SaaS) platform. This consists of 9 modules expected to automate the entire procurement process and lifecycle. The project is currently being spearheaded by KADPPA.

### • **Expected Benefits**

- Improve transparency in the entire tendering procedures.
- Generate significant saving by reducing cycle time and avoiding unnecessary paper works.
- Reduce the number of visits to related agencies and costs associated with procurement application for businesses.
- Provide equal information to all potential bidders and announce latest procurement activities of KDSG.

## III. e-Tax Payment System

An integrated e-Tax Payment System will allow citizens and businesses to report income, taxes, and duties/tariffs online. The integrated e-Tax Payment System will be an integral part of the government gateway that will provide a one-stop integrated solution for online payment of income tax, tariff and other taxes and will be designed based on the global standard system for safe payment and transactions.

### • **Actions:**

- Deploy an integrated e-Tax Payment System with modules including filing, billing, payment, and certificate issuance.
- KADIRS has implemented a single window tax administration portal.

### • **Expected Benefits**

- The system will create an enabling environment for taxpayers with simplified tax procedures and online registration/tax filing.
- Improve data integrity and interoperability.

- Enhance and transform collection, processing, monitoring and accounting of taxes.
- Achieve greater tax compliance through efficient tax administration and revenue management services.
- Reduce time and cost in tax collection and pin down risk of corruption.

### 3.5.6: Public Safety and Justice

#### I. e-Judiciary

There is a need for the introduction of an e-Judiciary to automate Kaduna State's judiciary. The e-Judiciary is a fully automated and digitalised court system. This will be interfaced with a Case Management System. Hence, e-courts will effectively and efficiently transform the whole court procedure.

- **Actions:**
  - Deploy an integrated e-Judiciary system that includes video conferencing for virtual courtroom and file sharing features.
- **Expected Benefits**
  - Accelerate the pace of dispensation of justice in Kaduna state.
  - Provide faster document filing and retrieval, eradication of the misplacement of case files.
  - Provide concurrent access to view the same case filed by different parties during court proceedings.
  - Potentially improve the level of attendance in court rooms and provide access to all parties irrespective of time and location.

#### II. Case Management System

The Case Management System (CMS) consolidates all the information concerning cases handled by the Justice ministry from inception to closure. It monitors and assess the performance of the counsels, courts, judges and other related staff with regards performance in case management. The CMS also provides case and crime reporting.

- **Actions:**
  - Deploy a Case Management System in the Ministry of Justice, with features such checking of cases, penalties and other related matters. Already deployed and requiring updating.
- **Expected Benefits**
  - Reduce the time and cost of administration of justice in Kaduna state.
  - Improve transparency, accountability and responsiveness of law enforcement organizations.
  - Provide better services online such as appealing, status tracking, deposition, payment of fine.

- Provide faster document filing and retrieval, eradication of the misplacement of case files.

### III. Digital Surveillance and Traffic Management System

A Digital Surveillance and Traffic Management System will optimise and automate traffic operation and state-wide surveillance by providing real-time information such as on traffic flow, traffic accidents, crime scene reports etc. This information can be collected from sensors on roads and CCTV cameras.

- **Actions:**
  - Deploy a Real-time traffic and surveillance system with modules such as road traffic management, traffic accident detection, overhaul control, and security surveillance.
  - Complete and commission all ongoing digital surveillance projects and extend to KKZ.
- **Expected Benefits**
  - Increase traffic convenience and conditions through effective response to serious traffic problems such as traffic congestion.
  - Improve safety of lives, roads and properties through 24/7 surveillance.

#### 3.5.7: Local Government Authorities (LGAs)

The Digitisation and Automation of Kaduna State LGAs is a key element in the overall state digital strategy. LGAs play a key role in ensuring KSDG realises its Development Plan. The Government will continuously strive to modernise the state's LGAs.

- **Actions:**
  - Improve communication and collaboration with and outside LGAs through the use of Modern Workplace technologies such as email and online meeting tools.
  - Onboard the LGAs to the government human resources and payroll system (BATMIS/SIFMIS).
  - Continuously engage in capacity building to ensure LGAs are skilled to use and drive the adoption of modern technologies in their agencies.
  - .
- **Expected Benefits:**
  - Reduce the cost of basic employee management through the realisation of paperless working environment.
  - Reduce simple repetitive employee functions through automation of employee affairs (self-service).
  - Improve work efficiency by focusing on strategic tasks while reducing non-strategic HR administration tasks of HR departments.

### 3.5.8: Legislature

The state legislature plays a key role in Kaduna State's development. Digitising and automating its processes will strengthen the institution, increasing efficiency and collaboration within the institution and across other arms of government.

- **Actions:**
  - Digitisation of Hansard.
  - Improve communication and collaboration with and outside the legislature through the use of Modern Workplace technologies such as email and online meeting tools.
  - Digitise human resources and payroll processes within the institution.
  - Continuously engage in capacity building to ensure members and staff of the legislature are skilled to use and drive the adoption of modern technologies in the institution.
- **Expected Benefits:**
  - Reduce the cost of basic employee management through the realisation of paperless working environment.
  - Reduce simple repetitive employee functions through automation of employee affairs (self-service).
  - Improve work efficiency by focusing on strategic tasks while reducing non-strategic HR administration tasks of HR departments.

### 3.5.9: Human Resources and Recruitment

#### I. Job Portal

A state-wide Job Portal will improve government recruitment by automating administrative processes relating to recruitment and enable job seekers to apply for jobs online, browse vacancies and other information etc.

- **Actions:**
  - Deploy a Job Portal with modules such as Job Posting Management, Job Searching and Application Management, Candidate Searching and Application Management, Personal Profile and Qualification Management, Statistics and Analysis
- **Expected Benefits**
  - Reduce time, cost and visits, while increasing efficiency throughout the entire job searching and recruitment process.
  - Provide a talent pool for KDSG.

#### II. Human Resources Management System

There is a need for a HRMS that includes all standard HR functions to comprehensively manage overall HR processes such as HR affairs, payroll, performance evaluation, training and education, and services to government officials.

- **Actions:**
  - Deploy a fully Integrated HRMS that has modules such as payroll, performance evaluation, leave etc that will ensure the achievement of long-term HR goals.
  - The HRMIS module of the SIFMIS system has been implemented however this is currently being reviewed to enhance its functionality and meet the expectations if a fully automated operation that is accessible from all MDAs.
- **Expected Benefits**
  - Reduce the cost of basic employee management through the realisation of paperless working environment.
  - Reduce simple repetitive employee functions through automation of employee affairs (self-service).
  - Improve work efficiency by focusing on strategic tasks while reducing non-strategic HR administration tasks of HR departments.

### 3.5.10: Environment

#### I. Environmental Information System

An Environmental Information System will help in monitoring and reporting various environmental data, which could be captured directly by the system, extracted from other integrated systems or enter manually after being captured from the field. This will give access to real-time data that will help in driving policies and decisions in Kaduna State.

- **Actions:**
  - Deploy an Environmental Information System with modules including Environmental Information Collection, Verification and Management, Environmental Information Analysis, Environmental Information Services, Environmental Information Monitoring, and State-wide Reporting.
- **Expected Benefits**
  - Improve quality of life of citizens by providing timely and accurate environmental information.
  - Share accurate information related to initiatives such as sustainable development goals as well as other organisations dealing with environmental information.

### 3.5.11: Utilities Management

#### I. Utilities Management and Billing System

Automation of asset management and billing in utilities provision services will enable citizens and business to pay public utility bills such as water with ease, which will significantly increase the payment ratios. Also, this will improve public asset management such as properties, facilities showing the current status of the properties, lifecycle, maintenance record.

- **Actions:**
  - Deploy an integrated system with asset management, billing, and online payment function.
  - The current solution being used by KADSWAC does not meet expectations and has to be replaced. A review is currently being undertaken.
- **Expected Benefits**
  - Provide easier and safer methods for utility bill payment.
  - Increase customer relationship management.
  - Increase revenue and collection.
  - Provide real-time management and tracking of asset.
  - Improve budgeting and acquisition of assets based on information such as asset lifecycle, depreciation etc.

### 3.6: Smart State

Societal and Economic Development is strongly affected by regional local physical infrastructure; by Telecommunication and transportation which are essential for production, distribution and access of employees to the workplace, and for access of customers to products; enterprise is also affected by financial infrastructure; and human infrastructure; and by settlement size and by the state of 'the economy' in general.

#### 3.6.1: Broadband Penetration

Accelerate Broadband penetration in to reach currently unserved and under-served communities in Kaduna State.

- **Actions:**
  - Provide incentives for operators, Telcos and infrastructure providers, extend build-out of Broadband infrastructure. E.g. recent abolishment of Right of Way (RoW) charges.
  - Explore strategic partnerships with operators to extend connectivity to key government locations.
  - Seek support from intervention agencies e.g. NCC, NITDA, USPF.
  - Seek collaboration with international development organisations and corporations.
  - Achieve 95% telephony coverage by end of H1 2021 with focus on security hotspots.
  - Achieve full broadband penetration in all tertiary institutions.
  - Achieve fibre broadband penetration in KKZ metropolises.
- **Expected Benefits**

- Improve quality of life of citizens by providing timely and accurate environmental information.
- Improve security of lives and properties.
- Improve quality of service delivery in healthcare and education.

### 3.6.2: Digital Economy and e-Commerce

E-Commerce is an increasingly important component of any modern economy. Kaduna state currently has very low level of e-Commerce activity and this must be encouraged to grow exponentially.

- **Actions:**
  - Drive broadband infrastructure penetration across the entire state through strategic engagements with MNOs.
  - Provide incentives to attract e-Commerce service providers to Kaduna state.
  - Establish a state consumer protection agency with a mandate that includes e-Commerce.
  - Implement a comprehensive digital addressing/post code scheme in the state.
  - Automate all citizen/business facing services in government.
  - Promote the gig economy through the development of partnerships with private entrepreneurs to establish ICT hubs and co-working spaces on under-used government property.
  - Establish ICT Village, which is a purpose-built facility for repairs, servicing, and sales of computers, mobile phones, and other digital equipment. With a future focus on design and assembly.
- **Expected Benefits**
  - Improved service delivery across impacted sectors, e.g. transportation.
  - Enhance the attraction of Kaduna as a modern metropolis to work and live.
  - Enhance self-employment among the youth
  - Enhance growth of support services such as logistics and transportation.
  - Maintain the leadership position of Kaduna State in the Sub-national ranking for Ease of Doing Business.

### 3.6.3: Digital Literacy

In today's digital world, nearly every career requires digital communication at some point and soon this will also apply to financial transactions. The government, businesses, workers (public and private), and citizens in general all have a stake in ensuring that a digitally literate society is created in Kaduna state.

#### **Actions:**

- Establish digital literacy as a criterion for career advancement in the state public service and provide direction and resources for training.
- Define and implement Digital Access programs that will drive digital literacy.

- Drive digital literacy and technology awareness of government officials and citizens.
- Collaborate with international development organisations to support digital literacy programs.
- Design and deploy a state-wide device ownership scheme to improve citizen and business participation in governance.
- **Expected Benefits**
  - Enhance economic growth and financial inclusion.
  - Improve quality of educational outcomes.
  - Improve the quality of the public service.
  - Improve the relationship and level of interaction between the government and the citizenry.

#### 3.6.4: ICT Sector Development

Kaduna state is well positioned to serve as the hub of the burgeoning ICT economy of Northern Nigeria. Its key advantages include – proximity to Abuja, a steady pool of talent supplied from established and reputable tertiary institutions, a modern Kaduna metropolis that is currently undergoing a massive urban renewal program. The Government is actively facilitating this opportunity to create growth and employment, especially among the youth.

- **Actions:**
  - Drive broadband infrastructure penetration across the entire state through strategic engagements with MNOs.
  - Actively patronise local ICT solution providers in government procurements without a compromise on key selection criteria.
  - Catalyse partnerships between local solution providers with IT OEMs and enterprises for project collaborations and knowledge transfer.
  - Collaborate with international development organisations to support skills development programs.
  - Youth Entrepreneur Support Scheme – YESS – Establish a pathway from the capacity building programmes by offering start-up funding packages to qualified interns.
- **Expected Benefits**
  - Reduce emigration of talent out of Kaduna state.
  - Creation of employment and meaningful livelihoods among the youth
  - Add to the attraction of the Kaduna state economic ecosystem.

#### 3.6.5: Financial Inclusion

The availability and equality of opportunities to access financial services is a key pillar in any society today. With IT, citizens and businesses can access affordable, appropriate, and timely financial products and services such as banking loans, digital currency, equity etc. The

government, businesses, workers, and citizens in general all have a stake in ensuring that financial inclusion is achieved in Kaduna state.

- **Actions:**

- Drive policies that ensure the uptake of financial inclusion initiatives with ease.
- Design and deploy technologies that provide access to numerous channels of finance to both citizens and businesses.
- Collaborate with international development organisations to support financial inclusion initiatives.

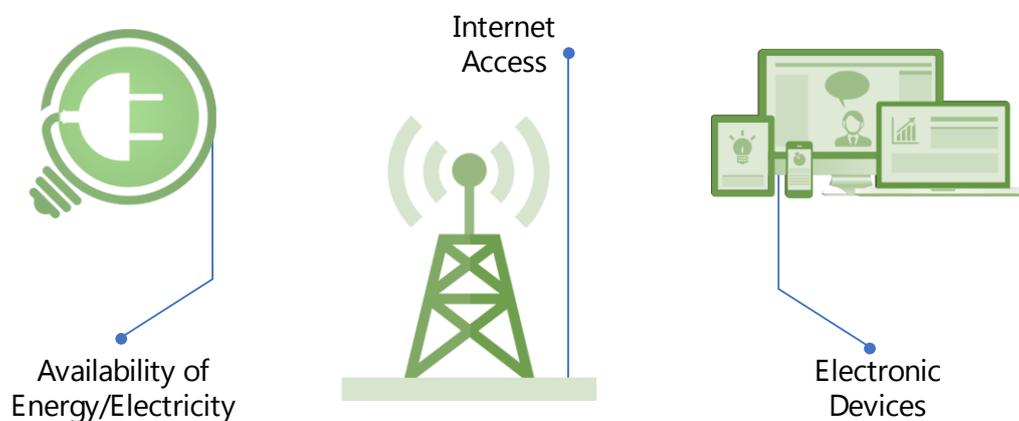
- **Expected Benefits**

Enhance economic growth and financial inclusion.

- Improve the quality of the public and private services.
- Enhance the attraction of Kaduna as a modern metropolis to work and live.
- Enhance self-employment among the youth.

### 3.7: Barriers to e-Government Adoption

#### Preconditions for e-Government Solutions



*Figure 5: Preconditions for e-Government Solutions*

*Table 2: Barriers to e-Government Adoption*

<b>Barrier Category</b>	<b>Barriers</b>	
Legislative & Regulatory	<ul style="list-style-type: none"> <li>- Legal constraints.</li> <li>- Lack of e-government policies and online laws.</li> </ul>	<ul style="list-style-type: none"> <li>- Misinterpretation/use of shared information, Security, privacy and confidentiality issues.</li> </ul>
Political	<ul style="list-style-type: none"> <li>- Resources allocation.</li> <li>- Different organizational priorities.</li> <li>- Unrealistic time frames.</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of champion and leadership support</li> <li>- Political constraints &amp; Bureaucratic nature of government.</li> </ul>
Organisational	<ul style="list-style-type: none"> <li>- Lack of institutional frameworks.</li> <li>- No shared goals, guidelines or tools,</li> <li>- Lack of business process reengineering.</li> <li>- Workplace inflexibility and responsiveness.</li> <li>- Lack of interoperability.</li> <li>- Lack of training.</li> </ul>	<ul style="list-style-type: none"> <li>- Resistance to information sharing.</li> <li>- Lack of continuity and comprehensiveness.</li> <li>- Lack of IT management and support staff.</li> <li>- Lack of human skills and capabilities.</li> <li>- Lack of innovative incentives,</li> <li>- Lack of awareness and promotion.</li> </ul>
Administrative	<ul style="list-style-type: none"> <li>- Lack of vision and strategy.</li> <li>- Administrative and management issues.</li> <li>- Lack of integration, collaboration and cooperation amongst government agencies.</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of collaboration with private sector.</li> <li>- Poor project management.</li> <li>- Poor user experience &amp; change management.</li> </ul>
Technological	<ul style="list-style-type: none"> <li>- Lack of user-friendly features in IT system.</li> <li>- Lack of technological infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>- Digital divide (i.e. literacy), Lack of e-education.</li> <li>- Lack of standardization in data formats.</li> </ul>
Economical	<ul style="list-style-type: none"> <li>- Lack of funding and financial resources.</li> <li>- Lack of competitive pressures forcing the change, No models to follow.</li> </ul>	<ul style="list-style-type: none"> <li>- Economic disparities, Socio-economic issues, Economical constraints.</li> </ul>
Socio-cultural	<ul style="list-style-type: none"> <li>- Lack of interaction with stakeholder &amp; disregarding stakeholders needs (agency-centric rather than customer-centric).</li> <li>- Redistribution of power, Lack of trust, Uncertainty and risks.</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of acceptance or buy-in.</li> <li>- Resistance to change. Cultural constraints.</li> <li>- Lack of ownership.</li> </ul>

## 4: Implementation Roadmap

*Table 3: Implementation Roadmap*

Initiatives/Projects	Related Pillar	H1-20	H2-20	H1-21	H2-21	H1-22	H2-22	Lead Agencies
<b>Development Pillars:</b>								
1. <b>Governance (G)</b> – Citizen engagement, Service delivery, Human capacity.								
2. <b>Economic Development (ED)</b> – Sustainable growth in producing and supporting sectors, and Infrastructural growth.								
3. <b>Social Welfare (SW)</b> – Distribution of wealth, Education, Health, Basic Services, Culture and Entertainment, Female empowerment.								
4. <b>Security and Justice (SJ)</b> – Prevention of crime, Efficiency, Fairness.								
<b>Legal and Institutional Frameworks</b>								
ICT Legal Framework	G, ED, SJ							GH, OSSG, MJ, KDHA
Institutional Framework	G, ED							GH, OSSG
ICT Skills and Capabilities	G, ED, SW, SJ							GH - OCIO, OHOS
<b>Policy and Governance</b>								
Government Enterprise Architecture (GEA)	G, SJ, ED							GH - OCIO
IT Policy	G, ED							GH – OCIO, OSSG, OHOS
IT Governance	G, ED							GH - OCIO

#### 4: Implementation Roadmap

Adoption and Change Management	G, ED, SW, SJ								GH – OCIO, OHOS, MBIT
Project Management	G, ED								GH -OCIO
IT Security	G, ED, SW, SJ								GH -OCIO
<b>Infrastructure</b>									
Government Network (VPN)	G, ED, SW, SJ								GH – OCIO, MF
Government Data Centre	G, ED, SW, SJ								GH – OCIO, MF
Government Contact Centre	G, ED, SW, SJ								GH – OCIO, MF
Devices	G, ED, SW, SJ								GH – OCIO, MF
<b>e-Government and Web-Services</b>									
Digital Identity Management systems incl. Residents enrolment	G, ED, SW, SJ								GH -OCIO, PBC, KADSRRA
Land and Property Management systems	G, ED, SW, SJ								GH – OCIO, MHUD, KADGIS, KASUPDA
Business Management systems – BPR, etc.	G, ED, SW, SJ								MBIT, KADIPA, GH -OCIO
Vehicle and Traffic Management systems	G, ED, SW, SJ								MPWI, MISHA, KASTLEA, KADSTRA, KADIRS, GH-OCIO
Government Data Exchange (ESB)	G, ED								GH-OCIO, MBIT
Government Gateway and Intranet Portal	G, ED, SW, SJ								GH - OCIO, M&C, OHOS

#### 4: Implementation Roadmap

Website and Intranet Portal Standardisation	G, ED, SW								GH-CIO, M&C
Microsoft Enterprise Agreement Renewal (Modern Workplace)	G, ED								GH-OCIO, MF, MBIT
<b>e-Government Services and Sectoral Initiatives</b>									
<b>Health</b>									
Integrated Health Management & Hospital Information systems	G, ED, SW								MH and agencies
<b>Social Welfare</b>									
Social Welfare systems _ Social Intervention and Benefits system	G, ED, SW, SJ								MHSSD, KADSRRA
<b>Agriculture</b>									
Agriculture Information System	G, ED, SW, SJ								MA and agencies
<b>Education</b>									
Education Information systems - Primary, Secondary & Tertiary	G, ED, SW, SJ								ME and agencies
<b>Finance and Budget</b>									
Integrated Budget and Accounting System	G, ED, SW, SJ								GH-OCIO, MF
e-Procurement System	G, ED, SW, SJ								KADPPA
e-Tax Payment System	G, ED, SW, SJ								KADIRS
<b>Public Safety and Justice</b>									
e-Judiciary	G, ED, SW, SJ								Judiciary, MJ
Case Management System	G, ED, SW, SJ								MJ
Digital Surveillance & Traffic Management System	G, ED, SW, SJ								MISHA

#### 4: Implementation Roadmap

<b>Human Resource &amp; Recruitment</b>								
Jobs Portal	G, ED, SW							GH-M&C, CSC
Human Resource Management System	G, ED							OHOS, MF, GH-OCIO
<b>Environment</b>								
Environmental Management systems	G, ED, SW							MEnv., KEPA
<b>Utilities Management</b>								
Utilities Management and Billing System	G, ED, SW, SJ							KADSWAC
<b>Smart State</b>								
Broadband Penetration	G, ED, SW, SJ							GH-OCIO, MBIT
e-Commerce	G, ED, SW, SJ							MBIT, KADIPA
Digital Literacy	G, ED, SW, SJ							ME, GH-OCIO, MBIT
ICT Economy	G, ED, SW, SJ							MBIT and agencies, KADIPA
Financial Inclusion	G, ED, SW, SJ							MBIT, MF, MHSSD and agencies

## 5: Conclusion

This Digital Strategy and Master Plan is the first for Kaduna State. It builds on the current ICT landscape in the state, taking into consideration where the state is and where it wants to be in 3 years in terms of ICT and e-Government adoption. Gaps have been identified and well-planned strategies have been highlighted to address the gaps. This Digital Strategy and Master Plan covers whole-of-government ICT and e-Government initiatives that serve the Government, Citizens and Businesses.

In order to successfully achieve the goals outline in this Digital Strategy and Master Plan, the recommended governance structure and processes must be in place. Strong governance ensures timely and efficient design and implementation of ICT and e-Government initiatives for Kaduna State. More importantly, there is a need for a cultural and mindset change to transition to a new IT and Data-driven economy. The Government, Citizens, and Businesses must be prepared to adopt IT and do things differently in order to “*Make Kaduna Great Again*”.

