"Digital Transformation in Tax Administration"

KENYA REVENUE AUTHORITY

ICT STRATEGY
2018-2021

'Towards Data Driven and Intelligence Led Decision Making'

FOREWORD

The advancement on the automation front and increased digitization in the economy has opened opportunities to increase the use of data to drive compliance and replace the current enforcement model with data driven compliance. Currently, technology trends, such as Big Data analytics, artificial intelligence (AI), machine learning, the Internet of Things (IoT), mobility and cloud computing have brought a huge impact on tax administration. It is on this basis that KRA has been at the forefront in leveraging on technology a game changer and a business enabler in tax administration.

The investment in technology propelled digitization and simplification of tax administration processes and integration of systems with other stakeholders leading to attainment of a single view of the taxpayer. This has played a great role in contributing to tax revenue growth from Kshs. 224B in 2003 to Kshs. 700 billion in 2012. This trend has continued over the years to Kshs1.4 Trillion in 2017-18 from Kshs1.3 Trillion in 2016-17.

This 3rd KRA-Wide ICT Strategy is aimed at transforming the Authority into a truly customer focused organization, through harnessing technology investment gains to transform the taxpayers experience, transit to a data driven, risk based and intelligence-led tax administration.

It is my hope that this Strategy will make the interaction with the Authority satisfying and ultimately enable us to mobilize the much-needed revenue for the government development agenda.

J.G. Mburu
Commissioner General

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REMARKS FROM
COMMISSIONER

This third KRA-Wide ICT Strategy is aligned to the Seventh Corporate Plan and it is based on the four balanced scorecard (BSC) perspectives. The Strategy will guide the technology investment in the Authority in the next three years.

Automation is central to the KRA Transformation Agenda. This Strategy focuses on building staff capacity to drive technology inventions for business enablement and providing the tools and capability that enable staff mobility, via telecommuting and virtual workspaces with a view to enhance KRA attractiveness and staff productivity.

This Strategy has also given special focus on customer experience by providing capabilities that enhance service delivery, bridging the gap between ICT and business in order to increase customer satisfaction.

The focus on business perspective is geared towards enhancing existing business systems to offer integrated, simple and cost effective services. Further, the ICT Strategy seeks to increase uptake and use of technology for operational excellence through better IT governance framework. It also seeks to optimize IT spend and manage the overall cost of operations.

Dr. David Kinuu
Commissioner, Corporate Support Services

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REMARKS FROM DEPUTY
COMMISSIONER - ICT

The 2nd ICT Strategy 2014/15 to 2017-18, running over the 6th Corporate Plan period focused on digitization of the business processes and providing automation capabilities to enhance business and revenue collection. The next frontier for the 3rd ICT Strategy, is to enhance business systems and integrations, exploiting emerging technologies to implement sound platform(s) and enable multichannel communication of business systems. Further, it aims at upscaling the business applications to run on mobile platforms whilst increasing the use of self-service platforms to enhance compliance and expand the tax base. As such, the Division endeavors to;

1. To make KRA a customer-centric organization. We plan to push our services to mobile platform, to intuitively deliver real-time 360° view of taxpayers and customize e-services through improved customer journey mapping. We recognize the emerging challenges brought about by increase in cyber-crime and identity theft. We commit to employ modern and best mix of breed technologies to secure corporate data and systems.

2. With cloud computing services becoming increasingly mature, we shall build an internal KRA cloud and use public cloud platforms based on government policy(ies) and risk assessment. We shall also lobby for appropriate policies to enable utilization of emerging technologies to transform tax administration.

3. We shall strive to contain the Total Cost of Ownership (TCO) through adoption of best practices in acquisition and deployment of technology solutions, and ensure full

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compliance with government policies in the acquisition and implementation of IT solutions and services.

4. Our staff are the cornerstone of our digital transformation journey. Therefore, we aim to revamp ICT skills on emerging technologies and build a competent and motivated ICT staff who will be instrumental in driving digital transformation agenda to drive revenue mobilization and improved service delivery across KRA business areas. We shall strive to retain core ICT skills, empower staff to work from anywhere and anytime, through implementation of End User Computing Solution based on VDI technology.

We will enhance the channels for taxpayer services with the sole aim of leaving them more satisfied with their overall experience. This will be achieved through use of simplified mobile-based application solutions and feedback framework.

We shall strive to deliver the initiatives identified in this plan to truly transform KRA to be among the leading revenue authorities in the world in the use of technology in tax and customs administration.

George Muraguri, CPA (K), CGIT
Deputy Commissioner, ICT

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ACRONYMS & ABBREVIATIONS

AMC	Annual Maintenance Cost
BCM	Business Continuity Management
BET	Business Enablement through Technology
BYOx	Bring Your Own anything
CBK	Central Bank of Kenya
CCB	Contribution to Core Business
COBIT	Control Objective for Information Technology
CRM	Customer Relationship Management
DC	Deputy Commissioner
DWH&BI	Data Warehouse and Business Intelligence
ECTS	Electronic Cargo Tracking System
ERP	Enterprise Resource Planning
ESB	Enterprise Service Bus
EUP	Economic and Upside Potential
GDC	Government Data Centre
IaaS	Infrastructure as a Service
iCMS	Integrated Customs Management System
ICT	Information and Communication Technology
ICTA	Information and Communication Technology Authority
IGS	Information Gathering System
iTax	Trademark for the Integrated Tax Management System
ITIL	Information Technology Infrastructure Library
ITMS	Integrated Tax Management System
KPA	Kenya Ports Authority
KRA	Kenya Revenue Authority
LAN	Local Area Network
M&E	Monitoring & Evaluation
PaaS	Platform as a Service
PESTEL	Political, Economic, Social, Technological, Environmental and Legal
PC	Personal Computer
PIT	Project Implementation Team

PKI	Public Key Infrastructure
PWD	Persons With Disabilities
RCoE	Requirements Centre of Excellence
SaaS	Software as a Service
SLA	Service Level Agreement
SLM	Service Level Management
SOA	Service Oriented Architecture
SWOT	Strengths, Weaknesses, Opportunities and Threats
TIMS	Tax Invoice Management System
VoIP	Voice over Internet Protocol (IP)
WAN	Wide Area Network

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1. INTRODUCTION

The Kenya Revenue Authority (KRA) was established by an Act of Parliament, Chapter 469 of the laws of Kenya, which became effective on July 1, 1995. The Authority is charged with the responsibility of collecting revenue on behalf of the Government of Kenya.

Specifically, the mandate of KRA is to:

a) Assess, collect and account for all revenues in accordance with all provisions of the written laws set out in Part I and Part II of the First Schedule relating to revenue;

b) Advise on matters relating to the administration and collection of revenue under the written laws or the specified provisions of the written laws; and

c) Perform such other functions in relation to revenue as the Cabinet Secretary to the National Treasury may direct.

Over the years, KRA's automation level has grown and today the Authority significantly relies on Information and Communication Technologies (ICTs) to collect and administer natural taxes. This has been facilitated by the Top Management support and enabling legal and regulatory framework in the country. The ICT Division facilitates the provision of ICT services both to the internal and external stakeholders. The mandate of the Division is to support KRA business objectives and also to significantly play the role of a game changer and business enabler' in KRA operations and business transformation.

The achievements realized in automation programmes have been guided by previous strategic plans, going back to as early as 2005. In the recent past, the successes achieved were guided by the 2nd ICT strategic plan whose focus was to enable KRA to become an automated single collector of taxes. The strategic plan guided the digitization of KRA processes and upgrade of KRA Wide IT infrastructure. In developing this 3rd ICT Strategic Plan, we build upon the previous achievements, to springboard KRA to a truly customer centric organization with simple, smart and intelligent solutions for business enablement.

 The 3rd ICT Strategic Plan is guided by, and aligned to, the 7th Corporate Plan, and further adopts the 4 balanced scorecard (BSC) perspectives outlined below:

a) Customer: The focus of the Customer perspective is to provide customer-centric IT services to both internal and external stakeholders.

The Strategy aligns ICT processes to corporate business needs with a view to enhance ICT service delivery as well as user experience in order to increase customer satisfaction.

b) Business Process: In the Business Process perspective, the focus is to enhance existing business systems to offer integrated, smart, simple and cost effective services in order to increase uptake and use of technology for operational excellence.

c) People and Tools: In this perspective, we focus on the ICT personnel who provide ICT services to the end users and indirectly to the taxpayers. The focus in this perspective is to reduce the gap between ICT, offer personalized service, monitor staff performance and enhance accountability. The pillar also aims at building staff capacity on specialized training in emerging areas that arise from implementation of this Strategy and providing users with best in class tools for end user computing.

d) Financial: The Financial perspective seeks to optimize on cost of KRA operations while mobilizing tax revenues.

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Over the years, KRA's automation level has grown and today the Authority significantly relies on Information and Communication Technologies (ICTs) to collect and administer natural taxes. This has been facilitated by Top Management support and enabling legal and regulatory framework in the country.

2. Evaluation of Implementation of the 2ⁿᵈ ICT Strategy

2.1. Achievement and Key Challenges of the 2ⁿᵈ ICT Strategy

The 2nd ICT Strategy 2014/15–2017/18, provided a blueprint for the last three (3) years on ICT investment and service delivery using automation programmes. The Strategy provided a framework to exploit and leverage on existing and emerging technologies and adoption of best practices to transform business processes to achieve full electronic customer service.

The vision was 'To Achieve Fully Integrated Electronic Customer Service', while the mission was 'To proactively leverage on innovative technologies to enable and support business through the provision of quality ICT services and solutions'.

The theme was 'Consolidation and up scaling the business value of ICT'. The Strategy was organized in eight strategic themes as highlighted in Figure 1.

Figure 1: Strategic Pillars of the 2nd ICT Strategy

The review draws' us into the following achievements, reasons for underperformance and lessons;

1) **Business Systems:** This theme aimed at 'increasing efficiency and effectiveness of business systems'. The initiatives in this theme resulted to digitization of core business process. The difficulties in user requirement management and project management led to delayed value realization. The vendor management inadequacies coupled with inability to enforce technology platform standards and knowledge transfer gaps paved way to vendor reliance and escalating Annual Maintenance Costs that increased the overall IT Spend.

2) **ICT Infrastructure:** The goal of ICT infrastructure theme was to 'increase availability of business systems and ensure continuity of business operations'. This Strategic pillar resulted to the development of the New Data Centre and upgrade of LAN & WAN connectivity in key stations. The key lessons learnt from this includes the need to;

o Maintain technology platform standards

o Build internal skills capacity and ensure knowledge transfer from vendors

o Have in place technology lifecycle management

o Enforcement of SLAs/penalties.

3) **Enterprise Information Infrastructure:** The goal of this theme was to 'establish a managed enterprise information infrastructure to improve the quality of information'. By the end of the Strategy period, the conceptualization of Service Oriented Architecture (SOA), Master Information/Data Source (MDS), Enterprise Service Bus (ESB) were incomplete. In addition, the Unique Universal Identifier (UUI) was never implemented due to challenges in roll out of national Public Key Infrastructure (PKI).

4) **Business Enablement through Technology (BET):** This theme aimed to 'leverage on ICT to enhance business capability and in turn improve ability to deliver services and enhance taxpayer compliance'. Three initiatives were not implemented at all: Geographical Information System (GIS), Emerging Technologies Standards (ETS) and Infrastructure Architecture due to gaps on the institutionalization of BET, instability of the ICT infrastructure to support new systems, e.g. Voice over IP (VoIP).

5) **ICT Project Management:** The goal of this theme was to 'improve project portfolio management in order to enhance value from project investments'. The key lessons learnt include the need for:

o A central committee/body to ratify/vet all projects implemented by the Authority

o Discipline in project portfolio management, project management and and

and independent body/division to undertake M&E; and

o Better contracting and vendor relationship management.

6) **ICT Risk Management:** This theme aimed at 'enhancing integrity of ICT infrastructure, systems and information' where security tools were acquired. A number of the initiatives were incomplete at the end of the Strategy period as result of re-prioritization;

o Web Application Firewall (WAF) Solution

o User and Network End-Point Management Solution (NEP)

o Independent IS Audit (ISA)

o Infrastructure and System Access (IMA)

o Single Sign On Capability (SSC)

o National Public Key Infrastructure (PKI)

g) **ICT Service Delivery:** This theme focused on 'improving efficiency of ICT service delivery'. The implementation gaps were attributed to the:

o Inability to recruit or retain core IT to the:

o Inadequate funding to develop staff skills to the required levels and failure to onboard identified industry consultancies on contractual basis; and

o Inadequate internal capacity to effectively implement the rolled-out modules of IT Service Management (ITSM).

h) **IT Governance:** The purpose of this was to 'enhancing IT governance in order to enhance compliance with best practice frameworks, standards, procedures and governance policies'. The implementation gaps were attributed to the:

o Compliance gap with the adopted IT governance frameworks;

o Inability to balance the gap between centralised ICT services and decentralisation of support staff; and

o Decentralization of support staff.

o Increase in software license cost.

The gap analysis of the 2nd ICT Strategy and strategic focus in the 3rd ICT Strategy are illustratedillustrated in Figure 2 below.

Figure 2: Implementation of 2nd IT Strategy, gap and way forward

Strategic Pillar	Implementation Level	Gap	Way Forward
Business Systems	70% iTax. iCMS, iSupport, CRM and iBoard	30% iCMS, Integration	M-Apps and M-Payments Integration
IT Infrastructure	73% NDC, Upgrade LAN and Stable Network	27% Alternate	Alternate DC Private Cloud Backup
Information Infrastructure	33% DWBI	67% BI, ESB. EDMS	Big Data Analytics Blockchain
BET	60% CRM, CM, VC/VDI, Mobile, Socio, VoIP and RECTS	50% Project Discipline & Completion Rate	M-Apps and M-Payment
Project Management	50% Prince 2, PM, PPM and Policy	50%	IT Investment Policy and Cost Mgmt.
IT Risk	60% ISMS, 27001, IPS and DAM	40% WAF, DAM	SSO Collaboration, Unified Dashboard
IT Service Delivery	**80% Recruited, Trained**	20% Scheme of Service	Lean, Skilled and Motivated Staff
IT Governance	80% ITIL, COBIT and Prince 2	20% Enforcement	IT Governance and Strategic Outsource
Pillar	Level of Implementation of the 2nd KRA-wide ICT Strategy	Gap	Way Forward

Overall, the Division accomplished 74% implementation of the strategic initiatives against the target of 100% by the end of the Strategy Period i.e. June 2018.

Figure 3 shows the lessons learnt and the how the same will be addressed in the 3rd ICT strategy.

Figure 3: Lessons learnt and the proposed way forward in the 3rd ICT Strategy

Lessons Learned	Way forward for 3rd ICT Strategy
Business Systems	
• Need to build capacity on user requirement management and process management to eliminate system reworks /enhancements.	• Restructure BTOs and build capacity in user requirement and process management including recruitment of business analysts
ICT Infrastructure	
• Need to strengthen internal capacity rather than relying solely on consultants /contractors • Need to enforce technology platform standards, technology lifecycle management, reduce number of vendors for ease management and enforcement of SLAs/penalties.	• Develop and enforce vendor technology transfer policy /guidelines • Standardize technology platform(s) • Upscale the SLAs management process • Enhance the capacity of the ICT infrastructure to support solutions, such as video conferencing and scanning and storage of images
Enterprise Information Infrastructure	
• Need to lobby with state actors on PKI, data sharing, taxation of digital economy and ecommerce	• Collaboration with relevant state actors on PKI, data sharing and other areas of interest
Business Enablement through Technology	
• Strengthen the innovation function implement IT related innovations • Need to manage applications maintenance costs for business systems	• Review the structure and mandate of the innovation unit, establish IT innovation/ ideation lab. • Build in-house capacity to maintain business systems, mobile applications solutions and other emerging technologies
IT Project Management	
• Need to have a competent, empowered office to manage corporate project portfolio, disciplined project management &projects M&E • Need for strong representation of ICT in the KRA investment budgeting programs	• Implement IT investment policy • Adopt and institutionalize project management framework: Development life cycle management, Monitoring and evaluation of project, Technology and skills transfer and Project risk management.
IT Security	
• Need for enhanced capacity for managing emerging IT security threats	• Collaborate with other government agencies • Acquire and consolidate IT security tools including single sign on and unified security dashboard • Strengthen the cyber surveillance function and resource base
IT Service Delivery	
• Restructure and reskill IT service management team to reduce the turnaround time in incident and issues resolution	• Implement floor/account managers • Review the skills sets required to provide support in specialized areas and revamp the skills sets
IT Governance	
• Control of IT Investments through development of appropriate policy(ies) • Need to improve communication and motivation of ICT staff	• Acquire the services an IT advisor on IT projects & Investment oversight • Establish a communication function in the Division • Lobby management on the on the best reward framework to address the unique work demands
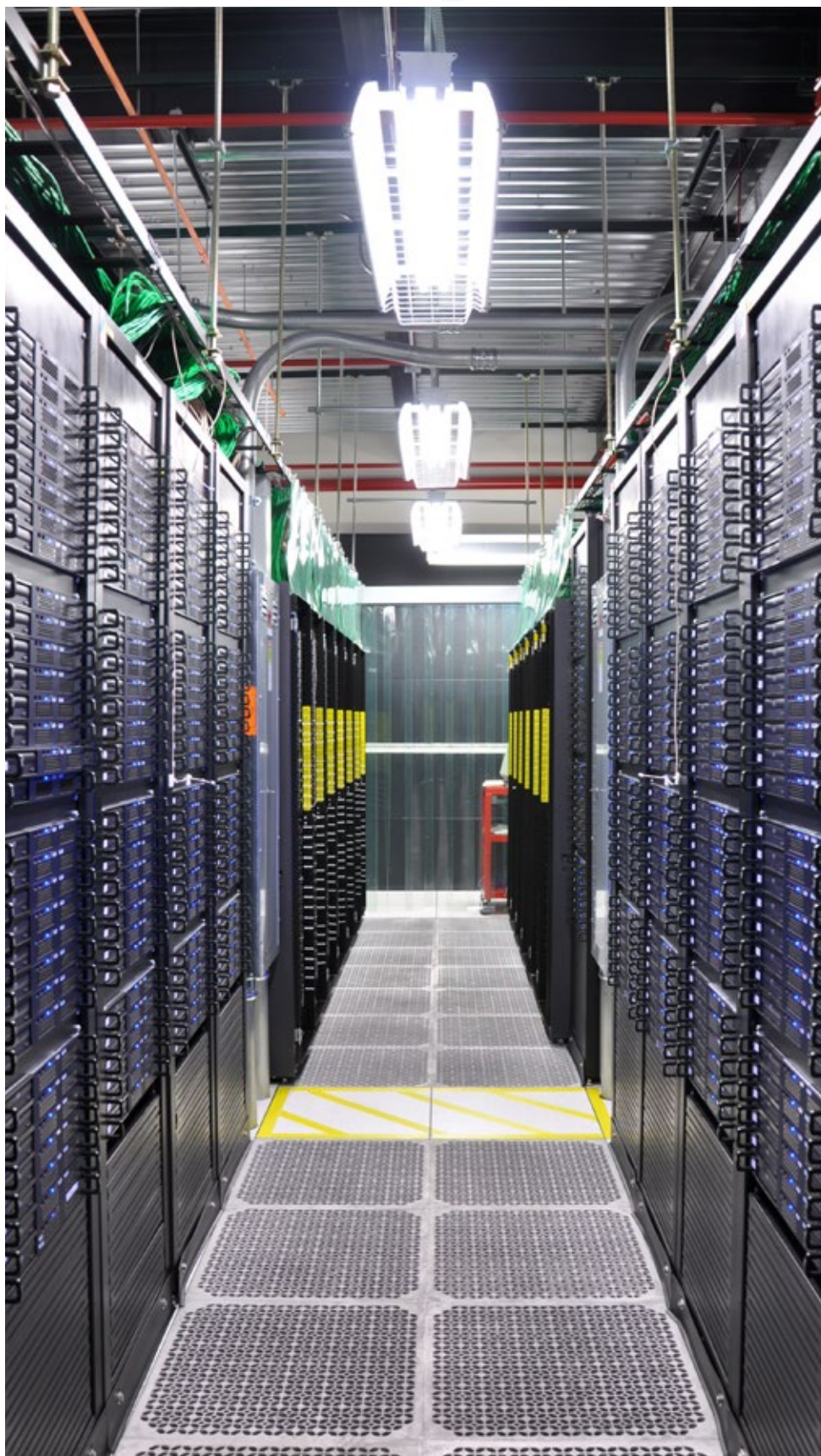
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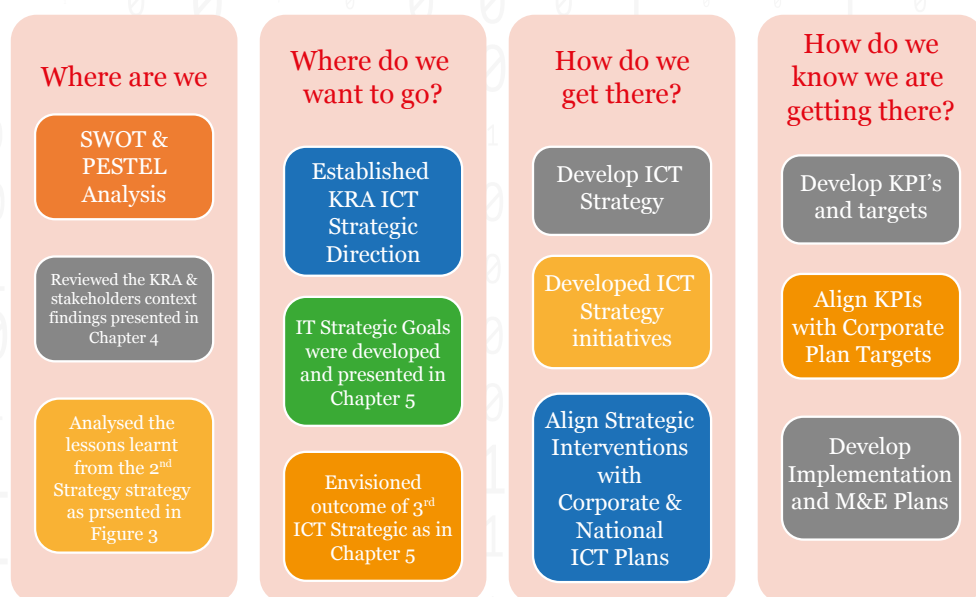
3. Development of the 3rd KRA ICT Strategy

The 3rd ICT Strategy aims at taking KRA to the next level in terms of adoption of suitable technologies and solutions with a view to enhance revenue collection, improve service delivery and compliance using data driven based decision making. It is recognized that technology is changing by the day, new technology solutions are forcing the mainstream business models to adapt to new and complex, borderless business environments. In addition, KRA is being faced with massive data both from internal and from third parties that is relevant to KRA business. This provides opportunities for improving compliance, acts as good source of information for policy changes and decision-making.

The next sections explain the approaches used in the development of the 3rd ICT Strategy.

3.1. **Methodology Used**

The first step in the development of the Strategy was to establish the current status on the implementation of the 2nd ICT Strategy, review of where we want to go, means of getting there and evaluation of the end state. The diagram below demonstrates the key components on the aspects considered under the four domains.

Figure 4: Methodology used for developing the Third ICT Strategy

The development of the 3rd ICT Strategy was driven by internal ICT employees comprising a team from selected user departments/divisions, ideas exchanged through workshops, use of questionnaires/interviews and inputs from an external facilitator who provided general guidelines.

The draft ICT Strategy received inputs from ICT staff, business departments/ divisions, KRA Management (KRA Team One), KRA Board of Directors, external stakeholders and partners. Members of the public were involved through the questionnaires hosted on the KRA Website. This 3rd ICT Strategy document was presented to Team One and the Board for approval. This participatory approach was deemed most appropriate with a view to enhance quality of the contributions, exchange of ideals and inculcate ownership.

3.2. Organisation of the 3rd KRA ICT Strategy

The chapter two presents the review of the implementation of 2nd ICT Strategy, detailing achievements, challenges and lessons learned. Chapter Three analyses both internal and external environments and identifies the strengths, weaknesses, opportunities and threats, by use of the SWOT and PESTEL frameworks. A final synthesis of the analysis of the environment is presented using the confrontation matrix from which the strategies are derived. Chapter Four describes the vision, mission, and core values derived.

The Chapter Five, outlines the Strategy in terms of strategic objectives, strategies and expected outcomes for each of the strategic themes identified. The Final Chapter outlines how the third ICT Strategy will be implemented. This includes the implementation plan, prioritization of the strategic initiatives to be implemented, monitoring and evaluation, ICT organizational structure and financial implications of the proposed strategic initiatives. It also identifies the risks that will underlie successful implementation of the Strategy and the mitigation strategies.

KRA has launched the 7th Corporate Plan(2018/2019 – 2021/2022) that focuses on the strategic initiatives and programs for the next three years. The 3rd ICT Strategy aims at addressing the needs as defined in the 7th Corporate Plan and government directives in adoption of ICT solutions. These two aspects will form the basis for the initiatives contained in this document.

4. Strategic Analysis of the ICT Environment

Strategic analysis involves analyzing both the internal environment and the external environmental in which the ICT in KRA operates. This analysis is critical in understanding the conditions within which ICT operates. Further, strategic analysis provides an appreciation of the capabilities of KRA and the external factors that affect it. In this analysis, two frameworks; PESTEL (Political, Economic, Social, Technological, Environmental and Legal) and Strengths, Weaknesses, Opportunities and Threats (SWOT) were used, and the results are presented.

4.1. PESTEL Analysis

PESTEL analysis is an external environmental analysis tool outlining the analysis of operating environment informing the development of the 3rd ICT Strategic Plan.

4.1.1 Political

The Government has been implementing a number of e-Government services through the Ministry of ICT and other ministries and agencies. These e-Government initiatives touches on the needs of the citizenry and other stakeholders. The e-Government services provide KRA with opportunities to integrate its systems with third party systems, invest in big data, analytics and enable tax compliance as well as tax base expansion. The implementation of Huduma Centres by the Government across counties also gives KRA the opportunity to use these centres to provide taxpayer services to the public.

Secondly, the Government in the recent past has centralized all ICT procurements by ministries, and MDAs to the ICT Authority (ICTA). This may slow down the Authority's ICT procurement processes. The Authority shall engage the ICTA to minimize negative effects on procurement implications of this strategic plan.

Finally, KRA has implemented a Primary Data Centre, with capacity to support Government Agencies. ICT will cost share and develop appropriate policy guidelines to guide on the usage of this facility.

4.1.2 Economic

The implementation of devolved governance structure has created 47 county governments. One of the key opportunities from an economic standpoint is the ability of KRA to collect revenue for County Governments. This creates the opportunity for partnering with county governments, enhancement of business systems and establishment of KRA County offices to tap the new revenue stream. This will in turn create the need for increasing presence in the counties making KRA tax services

more accessible, reliable and efficient to taxpayers. The Authority shall continue to enforce strict contracts and service level agreements with 3rd party service providers, enhance or develop additional online and mobile platforms to provide the services and increase service delivery touch points. This approach provides opportunities for our readily available local ICT talent. KRA shall tap young talented technology graduates from this pool through annual talent pipeline concept to breed new digital skills and replace redundant skills to through retirement and other exits. KRA aims to continue to develop internal skills and at the same time acquire necessary talents on emerging technologies to address ICT skill gaps. This enhanced capacity will enable the Authority to rump-up its automation agenda and deal with emerging challenges.

A key challenge though is some of the third-party sources are reluctant to integrate with KRA systems. This has potential to slow down the Authority's drive for single view of a taxpayer and may lead to lower revenue collection through revenue leaks. A second challenge is the weak ICT infrastructure in most of Kenya's rural areas. This means that KRA might have difficulty in rolling out its ICT infrastructure in those areas. We intend to address this challenge by riding on the government network infrastructure (GCCN).

4.1.3 Social

Kenya has experienced widespread adoption of mobile telephony for communication and data transfer, electronic banking, mobile money and access to eCitizen services. The mobile and electronic platforms present alternative channels for KRA to serve the taxpayer.

During the Strategy period, KRA shall strive to have its services be accessible through mobile platforms. The increased connectivity provides threats for cyber security challenges coupled with, taxpayers becoming sophisticated with respect to tax evasion. This may result in reduced tax collections from potential evaders and increased cost of managing compliance. We shall review our application development strategies with a view to create competence in mobile application development and also improve on our IS security strategies to combat cyber-crime.

During the Strategy period, we shall increase the taxpayer satisfaction with the KRA systems and processes, give adequate information to the taxpayer, provide better service and eliminate middlemen with a view to enhance tax compliance from especially non-filers by exploiting the potential for data analytics. We shall revamp and provide rich and relevant information to taxpayers using online and mobile platforms in order to enhance compliance.

4.1.4 Technological

The ever-changing technology landscape has brought with it new opportunities. Key technology advances include big data, Data Lake, data warehousing, data analytics, distributed ledger technology, artificial intelligence, cloud computing solutions, containerization of applications,

micro services and application programming interfaces (APIs). We shall appropriately leverage on these technologies to innovate and support the achievement of the Authority's goals. We shall explore the opportunities for enhancing data driven compliance using big data analytics and integration of internal and external systems via ESB/APIs and micro-services. We shall enhance use of the mobile apps/services as an additional channel for offering tools/solutions for improving taxpayer services and interactions.

The developments in technology have also created new online services such as on-line shopping, gaming and betting. We shall invest on tools to tap information on trading behaviors of these new online services and activities.

ICT security risks have become a major challenge in the public service as well as other sectors of our economy. To combat the challenges that come with changes in the technology landscape such as cyber security threats, technology obsolescence, complimentary security measures implemented by 3rd party network solutions and infrastructure, the Authority will deploy robust monitoring tools and implement own private cloud.

4.1.5 Environmental

Management of electronic waste (e-waste) is a big challenge to many organizations across the globe. KRA being a user of electronic based solutions shall strengthen and collaborate with relevant government agencies on electronic disposals. The key challenges from an environmental standpoint are a lack of a green ICT policy in KRA. In view of the level of automation, aging IT equipment and growing quantity of e-waste for disposal, we shall develop a green ICT policy for KRA in line with ICTA and National Environment Management Authority (NEMA) provisions.

4.1.6 Legal

Part of the KRA's mandate is to collect revenue from all taxable activities from taxpayers. This implies dealing with personal data from available sources. However, Kenya lacks an Act of Parliament that gives effect to Article 31 of the Constitution, which is 'to regulate the collection, retrieval, processing, storing, use and disclosure of personal data and for connected purposes'. The Data Protection Bill has been drafted and undergoing reviews. This Bill once passed will require changes in the manner personal data is received, processed, shared and stored. In addition, there is lack of supportive legislative provisions to support usage of some of the emerging technologies by public sector organizations, e.g. block chain and cloud computing. This may limit the exploitation of emerging or new technologies. We shall collaborate with Ministry of ICT and ICTA to ensure appropriate policies are in place to enhance utilization of the emerging technology for digital transformation in tax administration.

Finally, Kenya has increasingly become a litigious nation and therefore there is potential litigation from the external users, given the empowerment by the bill of rights in the constitution. KRA has institutionalized the Corporate Data Office (CDO) to facilitate and support Data Governance and Data Stewardship activities. KRA shall work with Data Governance Office (once established under the Data Protection Bill) to ensure data classification; Data Quality, Compliance, Privacy, Security, Architecture, and IT Governance are compiled in line with article 31 of the Constitution.

4.2 SWOT Analysis

The Strengths, Weaknesses, Opportunities and Threats (SWOT) framework analyzes both the internal and external environments of ICT in KRA. The framework provides a means of determining our strategies for the 3rd ICT Strategy. Over the plan period, we will leverage on our strengths to take advantage of opportunities, intervene in areas of weaknesses and threats. Table 1 summarizes the results of the SWOT analysis.

Table 1: Summary of SWOT Analysis Results

Strengths	Weaknesses
a) Improved digitization level of business processes b) Increased investment on core IT infrastructure c) Top Management support to business transformation and innovation d) Relative maturity of Service level management function e) Adoption of various IT best practices frameworks f) Skilled ICT staff to support automation initiatives g) The technology savvy millennials are becoming the majority in the workplace and want to be engaged through technology	a) Point to point integration of business systems and Data Migration gaps b) Piecemeal enhancements of business systems due to capacity gaps in requirement management c) Skills capacity and policies to enable exploitation of emerging technologies d) Discipline in Project portfolio and management e) Aging IT Infrastructure in the regional offices f) Inadequate capacity to control and standardize IT environment g) Negative perceptions on the integrity of KRA systems h) Insufficient ICT staff motivation
Opportunities	**Threats**
a) Government Big Four Agenda and associated funding to the aligned IT initiatives b) On-going e-Government projects e.g. Huduma Centers c) Devolution and base county IT infrastructure d) Government integration to IFIMIS e) Readily available local ICT talent f) Widespread adoption of mobile telephony, data services and fiber connectivity g) The existence of electronic waste (e-waste) recyclers provides KRA with an opportunity to partner with them to dispose e-waste	a) Potential for cyber-crime and cyber security threats b) Dependency and lock-in by 3rd party service providers c) Taxpayers are becoming sophisticated in tax evasion d) Challenges of taxing the flourishing online traders e) High levels of technology obsolescence, necessitating frequent investment f) Lack of supportive legislative provisions to support usage of emerging technologies g) The recent Government circular requiring that ICTA centralizes all MDA ICT procurements may slow down the Authority's ability to adopt new technologies and related ICT procurements h) High cost of software licenses

4.3 Benchmarking

Below are the findings of benchmarking studies:

a) Reporting Level of ICT. The reporting level of the head of ICT is directly to the CEO. This is in line with the strategic recommendations of the IMF East AFRITAC Technical Assistance Mission of November 2014, which recommended that with the critical role of ICT, the head of ICT in KRA should be at par with the business unit Commissioners. With ICT role becoming increasingly critical in the Authority, there is need to provide adequate visibility and appropriate leadership. We shall engage Management and the KRA Board of Directors in strengthening the leadership of ICT to the position of Commissioner and reporting directly to the Commissioner General. This is in line with COBIT5 best practices and benchmarking reports reviewed

b) Leveraging on Technology. The October 2017 PWC and Microsoft reports (https://www.pwc.nl/nl/assets/documents/pwc-digital-transformation-tax-oct2017.pdf) on digital transformation for tax administration identify the following as critical technologies for digital transformation: big data analytics, artificial intelligence, machine learning, internet of things, mobility and cloud computing. For cloud computing, in line with the General Data Protection Regulation (GDPR) (EU) 2016/679 and ICTA cloud adoption guidelines, there is consensus that it is against these standards to store citizen data on public cloud. Therefore, there is need for robust policy on emerging technologies utilization. For cloud computing, KRA will invest on private cloud for storage of citizen data, while application and selected transaction data will be integrated to the public cloud based on approved risk assessment outcomes.

c) Customer Centricity. One of the guiding principles for the New Zealand ICT Strategy (https://www.ict.govt.nz/Strategy-and-action-plan/Strategy/) is that customer insights must inform service design and delivery. Customers should be shielded from the internal complexities of government. In addition, the October 2017 PWC and Microsoft report on digital transformation for tax administration argues for taxpayer-centric solution, with personalized, simple, consistent, intuitive and real-time delivery of services that will build a 360° view of a taxpayer. On this basis, the strategy will develop a strategic pillar on user experience to exploit the benefits that come with customer centricity.

d) In-house Applications Development. The benchmark study shows that RAs "mission critical" systems are developed in-house. This approach reduces the cost of software maintenance. KRA will develop internal capacity to develop and maintain its applications in-house

e) Role of Consultants. Further benchmark study show that RAs are outsourcing consultants for specific short and managed engagement to complement internal staff capacity especially in developing systems. KRA will explore and engage consultants with the required skills to complement its internal capacity.

f) Innovation. RAs (Swedish, Uganda, South Africa) have an ICT R&D and innovation team that co-ordinates innovation in the RAs, but actual innovation is open to all staff because they are in a better position to understand their pain areas and seek for ways to improve on them. As (Swedish, Uganda and South Africa) have an ICT R&D and innovation team that co-ordinates innovation in the RAs, but actual innovation is open to all staff because they are in a better position to understand their pain areas and seek for ways to improve on them.

4.4 Confrontation Framework

We will use the Confrontation 'Matrix' framework in the SWOT to identify the issues that we can leverage on to overcome our weaknesses and respond to the external environment. The confrontation framework will assist us identify how to leverage on our existing strengths to take advantage of opportunities, overcome our weaknesses and minimize impact of threats.

	Strengths	Weaknesses
Opportunities	**(We will use existing strengths to take advantage of opportunities)** a) Expansion of our digital platform to exploit growing digitisation of the economy b) Integrate with stakeholder systems to achieve 'single' view of taxpayers and improve compliance c) Resource mobilization from Development Partners to fund ICT initiatives d) Push KRA services onto mobile and online platforms and increase service delivery service touch points to meet the increasing demand for accessible, reliable and efficient tax services from taxpayers e) Develop/support systems in-house to minimise the cost of software licenses from outsourced systems	**(We will tackle our weaknesses to prevent us from missing opportunities)** a) Implement ICT Strategy to tackle existing business systems weaknesses and exploit increased digitisation for tax base expansion b) Provide rich and relevant information to taxpayers on our KRA website and through all the other public engagement platforms, including media in order to enhance compliance c) Train ICT staff on emerging technologies, platforms and tools in order to develop innovative solutions that enhance data driven compliance and widen the tax base d) Strengthen R&D and innovation in order to leverage on emerging technologies to provide solutions to business
Threats	**(We will use existing strengths to reduce probability and impact of threats)** a) Leverage on automation and partnerships to develop an e-commerce strategy b) Engage the ICT Authority (ICTA) to minimise negative effects on ICT procurement given the recent Government circular requiring that ICTA centralises all MDA ICT procurements c) Collaborate with other agencies to tackle cyber-crime d) Use automation to minimise operating costs	**(We will act on our weaknesses to mitigate threats)** a) Implement measures to secure KRA against cyber-attack b) Tackle integrity challenges to minimise scope for cash-based businesses c) Integrate systems to allow for 'single' view of taxpayer, improve customer service and limit scope for evasion d) Build capacity in new skills and specialised technology solutions to exploit the benefits e) Implement an improved Customer Service Delivery Model to improve the quality of ICT services to customers f) Implement and enforce project portfolio management and project management standards to reduce cost of projects

5. Vision, Mission, Theme and Core Values

5.1. ICT Vision

The KRA corporate vision is to be a:

A globally trusted revenue agency facilitating tax and customs compliance

The Transformation Vision is to be a:

A Tax Administration offering efficient customer focused tax services based on data, risk and intelligence by leveraging technology

The ICT vision is:

To be a leader among revenue authorities in the use of smart technology solutions in tax and customs administrations

5.2. ICT Mission

The KRA corporate mission statement is:

Building Trust through Facilitation so as to foster Compliance with Tax and Customs Legislation.

The ICT mission is:

To develop Smart ICT solutions delivered creatively to offer a unique business experience to taxpayers

5.3. Theme for 3rd ICT Strategy

In alignment with the business thrust in the 7th Corporate Plan, the theme for the 3rd ICT Strategy is:

'Digital Transformation in Tax Administration'

5.4. ICT Core Values

The corporate core values are (TECH):

a) Trustworthy – Employee strives to act in a manner that builds trust with our stakeholders; is open, transparent and predictable to customers and always tells the truth.

b) Ethical – The employee lives and acts in ways that are consistent with good behavior and adheres to a set of principles that stakeholders find acceptable; his/her words are consistent with action.

c) Competent – The employee integrates his/her knowledge, skills, abilities and other attributes to perform effectively on the job, do the right things and deliver services in the right way.

d) Helpful – The employee demonstrates that they are giving or ready to give help. He/she is simple, available, reachable, accessible and

dependable in service.

In addition to embracing the corporate core values, ICT will also be guided by the following additional core values in order to upscale the value of ICT to business:

a) Professionalism - Doing the right thing the right way

b) Team-Work - Collaborative effort to achieve common goals

c) Customer-Focus - We listen, we care, we serve

d) Dependability - We do what we say we will do

e) Innovativeness and Agility - Think like there is no box, think smart


Digital Transformation in Tax Administration

Our Core Values

6. Strategic Objectives, Strategies, Outcomes and Key Initiatives

The Third ICT Strategy has been developed in alignment with the Seventh Corporate Plan which is based on the four balanced score card perspectives; i.e. People, Customer, Business Process and Financial. Drawing upon the synthesis of the situational analysis and the adopted confrontational Strategy, the strategic objectives strategies and outcomes for each perspective are summarized below.

Figure 4: The 3rd ICT Strategy Vision Diagram
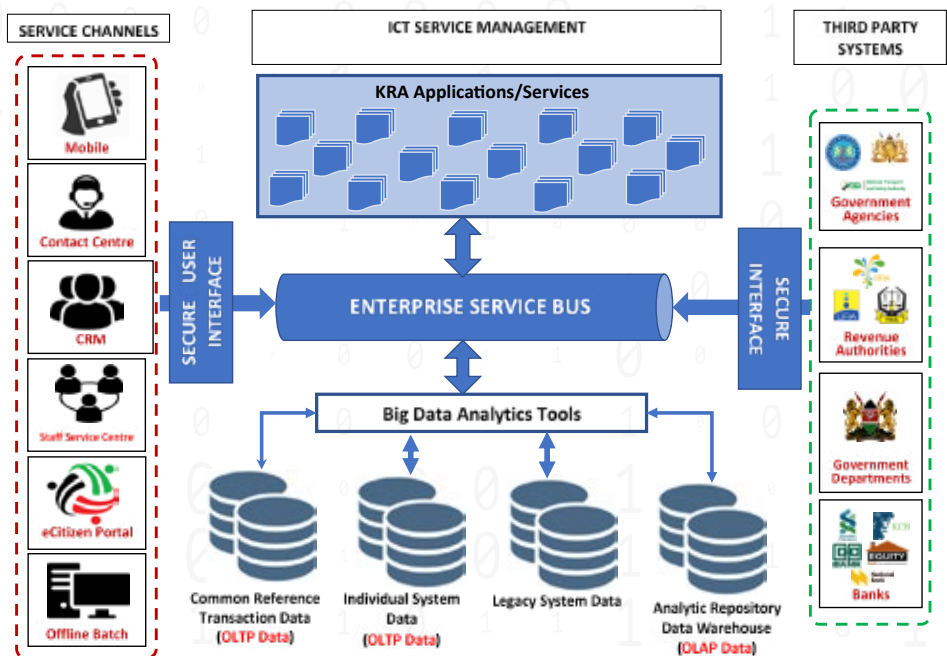
6.1. People Perspective

The People perspective refers to the ICT staff. The overarching goal of the People pillar in the Seventh Strategic Plan is 'a competent, performance driven, customer focused and motivated staff'. In the strategic analysis in Chapter 4, we identified the need to build ICT staff capacity on technical, managerial and emerging technology skills including knowledge transfer from vendors.

This Strategy focuses on building staff capacity to drive technology inventions for business enablement and providing the tools and capability that enable staff mobility, via telecommuting and virtual workspaces with a view to enhance KRA attractiveness and staff productivity.

To harness the business value of emerging technologies, in the industry, firms are creating internal expertise in cyber security, big data analytics, information management, architecture and standards, supplier and contract management, and mobile technologies. Therefore, we aim to revamp ICT skills on these emerging technologies to build a competent and motivated ICT staff to drive digital transformation for business enablement. Informed by these strategies, KRA will develop adequate skills in critical ICT domains in order to provide superior ICT services. The Authority will ensure that skills and knowledge transfer is impended as deliverable item during implementation and commissioning of new IT projects.

Tooling to Optimise IT Operations

There is need for ICT Division to have an effective interface to the business departments/divisions. The 3rd IT strategy is cognizant of the need for greater responsiveness and collaboration with teleconferences, knowledge-based platforms, virtual team workplaces, intelligent portals, internal social media tools and mobile apps, eLearning tools and experts that can be reached online with communication/ collaboration tools. We shall invest on self-service, intelligent reporting (report builders, dashboards, easy connectivity, and improved analysis to maximize operations. We shall empower staff to work from anywhere and anytime, through implementation of End User Computing Solution based on VDI technology, while proving staff with computing tools such as PCs, printers, mobile iPads as the budget permits. Our goal is to attain 1:1 staff to computer ratio.

Performance Measurement

Performance measurement dashboards and reporting present a feasible way to maintain buy-in, ongoing support from our stakeholders. They also enhance process transparency and accountability. Effectively measuring performance involves periodically assessing set KPIs, relevance, progress, efficiency and the impact of activities with respect to project objectives. The tangible outcome of monitoring and measuring to help in periodic progress reports (e.g. semi-annual or annual) to key stakeholders. We shall review our performance criteria, review KPIs and productivity indices to ensure our team performance is well articulated

Establish a Talent Pipeline

Finally, the Authority has witnessed an increasing trend of skilled staff leaving for greener pastures in other organizations particularly once they have acquired knowledge and experience in IT. The Strategy takes cognizant of the need to enhance teamwork, improve remunerations, increase promotions, better skill matching; rationalize workload distribution and growth for qualified IT personnel. We shall strive to retain core ICT skills.

There is therefore need for the Authority to adopt HR practices that favour the organization, such as sourcing and retaining high/expert skills and use of contract, short-term contracts, supported by an appropriate succession

Strategy to provide a fall back in case of the inevitable exists of key skills. We shall work with universities with a view to absorb 5-10 top talent on critical emerging skills on short-term three-year contract through a rigorous talent search programme. The staff will inbreed new skills and fill gaps left by exiting and retiring staff. In this respect, the Authority will pursue the following strategic objectives:

Strategic Objective O1: To recruit, develop and retain competent and motivated ICT staff

In order to achieve this objective, the Authority will pursue the following set of strategies and initiatives to achieve the indicated outcomes:

Strategies	Initiatives	Outputs/Outcomes
S1.1 To recruit, develop and retain competent and motivated IT Staff	S1.1.1 Implement IT talent pipeline programme augmented with a flexi short-term sourcing strategy for specialized ICT skill-set to complement existing skills	Oc 1.1: 100 new ICT staff recruited Oc 1.2: 10 talent absorption from local public universities annually
	S1.1.2 Train & reskill ICT staff on emerging technologies, platforms and tools in order to develop/deploy innovative solutions and support them in-house	Oc 1.3: 95% itax and iCMS support done in-house Oc 1.4: 120 staff trained on emerging IT skills
	S1.1.3 Develop and implement a KPI based performance framework, motivate/reward exemplary performance and establish a reward framework to address the unique ICT work demands	Oc 1.5: 100% high/excellent performers rewarded.
	S1.1.4 Review and revamp ICT Managers' IT governance, leadership, coaching and mentorship skills sets	Oc 1.6: 95% ICT leadership score rating

6.2. Business Process Perspective

The Business Process perspective refers to how ICT can be used to improve the efficiency and effectiveness of internal processes and add value to business operations. The strategic objective and the overarching goal of this pillar in the Seventh Strategic Plan is 'simplification of customer facing services and data intelligence driven business processes' in order to achieve 'data and intelligence driven organization'.

6.2.1 Business Systems

The 2nd ICT Strategy saw the digitization of the core business and support department processes, this has played a great role in contributing to tax revenue growth from Kshs. 224B in 2003 to Kshs. 700 billion in 2012. This trend has continued over the years to Kshs1.4 Trillion in 2017-18 from Kshs1.3 Trillion in 2016-17. However, we did not manage to achieve full integration of internal and external systems to facilitate data matching for business decisions. The current point-to-point integration has limitations with respect to flexibility, cost and risks associated with inappropriate methods for service monitoring. The 3rd ICT Strategy focus is on the

flexible integration and optimization of the capabilities of the business systems invested in for business value realization.

To enable integration/linking of the internal business systems (itax, iCMS, iSupport) and external systems, allow data matching and use of automated risk engines in iTax and iCMS for targeted intervention. The Authority shall implement Enterprise Services Bus with API capabilities, taking advantage of micro services. As illustrated in Figure 4, The ESB will provide a secure flexible, application integration platform within the core systems to empower the business and taxpayer to query their transaction status and related queries for information sharing with KRA, government and other stakeholders. An ESB solution will be therefore an internal "Bus" that allows applications and services to communicate with each other in an uncoupled fashion. With ESB, all applications can hook into the bus, publish their message and all interested parties listen and react without directly connecting with each other.

To enhance integrations with external systems, the Authority will implement an Application Programming Interfaces (APIs) capability on ESB to allow consolidation of services across disparate endpoints as if they were all coming from a single host. Logically, the API Gateway will not be a replacement or/alternative for an Enterprise Service Bus, but rather an enhancement of ESB or a means by which the external services in ESB will be designed and delivered. With regard to APIs, KRA has implemented web services for communicating with 43 banks and partner government agencies like KENTRADE, KPA and the National Treasury. However, integration with other players in the private sector is an initiative we are yet to align with KRA security and related data protection policies associated with it. The weak point in an API is that they can expose taxpayer data, backend server appliances and to unauthorized access, putting the Authority at risk. Nevertheless, most API security risks can be largely mitigated by tools and best practices. In light of this, KRA shall implement a robust and reliable ESB that provides KRA agile and secure integrations in a cost effective way. It is expected that the ESB will provide the integration benefits of standardization, loose coupling, resilience and high availability, monitoring and intermediation. We shall engage EOMs in development-customized interfaces (APIs) between KRA and vendor solution that will specifically facilitate tax filing and payments.

With advanced uptake of mobile phones in the country, we shall push key taxpayer services to the mobile and related platforms to ensure taxpayers and other end users are able to track their services via workflow system without physically visiting KRA premises. Our strategy is to have integrated inward-looking (internal end-users) and outside looking (external users) mobile solutions. We shall also build systems with thin infrastructure footprints such as mobile versions or mobile apps to enhance accessibility in areas with weak infrastructure bandwidth.

Strategic Outsourcing

KRA at the moment outsources the following infrastructure-related services:

wide area network (WAN) services, internet services, maintenance services for commercial backup power and security appliances. The Authority should take advantage of outsourcing opportunities to outsource more in areas where skills lack internally or identified non-core IT services that can be effectively done by others. Consequently, we shall adopt a flex-outsourcing model driven by need, and thoughtful evaluation on all our five IT artifacts (People/humanware, Hardware, Software/applications, Networks, and IT content). For Applications Development and Maintenance Strategy, we shall adopt a mix of both in-house and outsourced models as summarized below:

a) Outsource development depending on the type of application needed, complexity, urgency and the skills required. In areas where skills lack internally, it is prudent to outsource.

b) Maintenance of large systems to be preferably managed internally. This however will be considered on a case by case basis, informed by the cost benefit analysis, skills required and availability of source code. We shall outsource maintenance only when requisite skills and competencies cannot be obtained internally, or if the source code is not available due to IPR considerations.

c) Less complex systems and where KRA has the skills and competencies, it is best to develop applications in-house due to the vast business knowledge and a good understanding of the business requirements and better control. This will also reduce the total cost of ownership of these systems.

A Modern Software Development Center and Ideation Hub

Deliberate effort will be made to ensure that major applications are maintained in-house to optimize on IT cost. In this regard, we shall maintain, support and enhance core business systems internally. This means we shall build a modern application development center that will also incorporate an innovation hub. The SDC will facilitate integrations and APIs, Mobile applications, big data analytics and risk-profiling solutions, AI, block chain and Machine Learning, enterprise wide system architecture and digital tax collection service which include electronic payment systems.

6.2.2 Information Infrastructure and Business Enablement

Enterprise information infrastructure is driven by the need to shift emphasis from 'operational' business activities to 'compliance' activities, based on risk analysis and intelligence-led decision-making.

The focus of the business in the 7th Corporate Plan and the Transformation Agenda is towards intelligence driven compliance. Essentially, we aim to be more proactive in our response to data received, relating data from multiple sources, to anomalies automatically detected by our systems.

In this strategy, we envision to have citizen-centric systems that integrate information from multiple sources and enable personalized services with

AI (chatbot assistants) over lower value repetitive and time-consuming tasks, so staff can focus on value-add services. An automated, integrated system is expected to address these expectations by reducing manual inputs and minimizing the risk of errors by checking for discrepancies in real-time and immediately correcting them.

The Authority shall integrate with key information sources, which include; land data, business registration systems, mobile data (Mpesa and mobile telephone registration details), Business Registration Service (BRS), Ministry of Land system (LMIS), and National Securities Exchange (NSE), Central Depository Systems (CDS). The authority shall also FastTrack the implementation of the LIMS/iTax, County integrated Revenue systems. The Authority will therefore identify and implement suitable technology solutions to interrogate both structured and unstructured data from different sources. We shall, FastTrack the implementation of data warehouse & business intelligence (DWBI) with Risk Module & BI capabilities and explore use of data lake concept for business enablement in this initiative.

Big Data Analytics

We envision that with almost 90% of digitization done, advanced analytics that build predictive and cognitive modelling for taxpayer segmentation and risk analysis will be the new frontier for the Authority. The success of these integrations will provide an avenue for enriched data analysis around the taxpayer economic activities as well as improve on tax compliance. We shall expand our digital platform to exploit growing digitization of the economy by investing on web crawling tools. This will significantly enhance agility and capability of business to expand the tax base, detect and deter possible tax evasion.

The current knowledge management (KM) capabilities are confined to information and document storage/search. Our KM strategies have to evolve to encompass all structured and unstructured information across the Authority, and in the long term become a key organizational driver. Technically, this will need consideration of better knowledge management capabilities.

In respect of both business systems (6.2.1) and information infrastructure and business enablement (6.2.2), the Authority will pursue the following strategic objective

Business Perspective Security

Simple at the front, complex at the back

Strategic Objective O2: To enhance existing business systems to offer integrated, simple and cost-effective services

In order to achieve the above objective, the Authority will pursue the following set of strategies and initiatives to realize the indicated outcomes:

| Strategy	Initiative	Outputs/Outcomes
S2.1 Consolidation and integration of business systems	S2.1.1. Implement Enterprise Service Bus (ESB) and Application Programming Interfaces (APIs) to enable internal & external integrations) for TBE and business decision making.	Oc 2.2.1: 100% business data consolidated and 25 integrations via Enterprise Service Bus
S2.2 Enhance business systems to be more efficient and effective	S2.2.1 Support ongoing process automation initiatives (iCMS, GIS, IGS, TIMS, iCare, LMS, Intelligence Gathering System, iSupport, iLaw, DWBI with Risk Module & BI capabilities, data lake, Integrated scanner solution, content management solution) for enhanced digitization of KRA business processes	Oc 2.2.1: 99% automation level achieved
	S2.2.2. Implement & innovate business systems with; Mobile, GIS, Big Data analytics (including e–commerce), artificial Intelligence(AI), PG and block chain technologies	Oc2.2.2 innovative solutions implemented for tax base expansion
	S2.2.3 Implement KRA mobile App to push services onto mobile and online platforms and increase service delivery service touch points	Oc 2.2.3: 100% implementation of KRA mobile APP
	S2.2.4 Continue to enhance and upgrade the existing Knowledge Management capabilities through skills and knowledge transfer on automation projects	Oc 2.2.4 100% rollout of the KRA-wide knowledge management hub
	S2.2.5. Develop and implement an Integrated County Revenue System	Oc 2.2.5: 100% developed system with at least 50% of the counties using the system
	S2.2.6 Implement personal Assistant/Online Help to enhance user experience with KRA systems	Oc 2.2.6: 1 Personal Assistant and 1 system online help deployed
	S2.2.7 Implement a data migration Strategy and Decommission/Retire Obsolete Systems to reduce cost and risk vulnerability	Oc 2.2.7: Retire 17 obsolete systems
S2.3 Improve application management capability	S2.3.1. Build capacity for Requirement Centre of excellence to enhance quality of automation	Oc 2.3: 20 Business Analysts certified
	S2.3.2 Develop/support systems in-house to minimize the cost of Annual maintenance costs from outsourced systems	Oc 2.5: 100% of core systems maintained and enhanced internally
	S3.3.3 Build a modern Application Development center with an ideation hub	Oc 2.5: 100% commissioning of the SEC and IH

6.2.3 ICT Infrastructure

The increased automation of business process has an effect of putting heavy reliance by the Authority on the ICT platform. The need for stable and reliable infrastructure platform to guarantee the systems/service availability is critical to our success. Further, the demand for tax base expansion and opening of new offices in counties demands a robust connectivity, stable Internet and reliable power backup solution. Currently, some of the core infrastructure components are obsolete to guarantee required uptime. We shall complete the implementation of our state-of-the art primary data centre, upgrade our power backups, core infrastructure components and refurbish the secondary Data Centre. The secondary Data Centre/DR (Disaster Recovery Site) will be used as an alternate site for real-time backup and system recovery. We shall also explore colocation options the 2nd DR site option. Therefore, we shall upgrade Existing Infrastructure, extend connectivity to new KRA stations/County Offices exploiting containerisation- Cloud, virtual desktop, Bring Your Own device (BYOx), and build secondary data centre with real time replication to RPO and RTO that support KRA business continuity and availability needs. This will guarantee the Authority 99.9percentage availability and the desired recovery point objectives (RPO) and recovery time objectives (RTO) emphases in the corporate business continuity plans.

Cloud Computing Infrastructure

With cloud computing services becoming increasingly mature, we shall use internal KRA cloud as well as public cloud where applicable and depending on the risk analysis. In view of the international and pending local laws, we shall host personal information in a private cloud. This will enable the Authority provide the required level of data protection and at the same time enjoy the benefits that may accrue in the use public. We shall use virtualization and provision of Infrastructure as a Service (IaaS) solutions from the New Data Centre and adopt the best practices/standards on ICT environment management to transit KRA to a 3rd IT infrastructure platform.

Evolving IT Infrastructure

Source: IDC, 2012
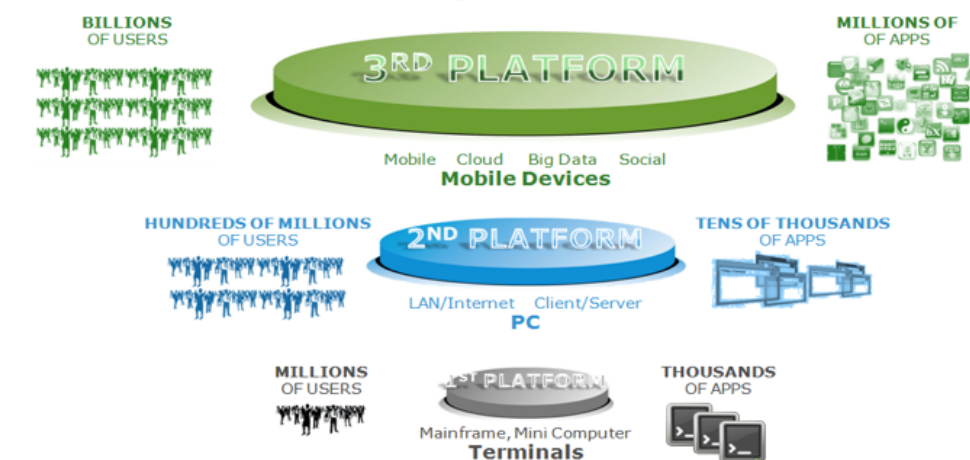
For cargo management coordination, we shall acquire requisite bandwidth and storage to store, process and scanner. We shall also implement containerization cloud with a view to efficiently virtualize our storage and computing environment.

6.2.4 Information Systems Risk Management

ICT security risks have become a major challenge globally. Firstly, there is need to address the key sources of risks through eliminating multiple user accounts by creating a single view of users; increasing enforcement and awareness of ICT policy and standards; and implementing effective application controls during systems design. Secondly, there is need to continuously improve the positive perception of the integrity of ICT personnel by ensuring adequate risk assessment in ICT processes and adherence to Enterprise Risk Management (ERM).

We shall have a holistic approach to managing Cyber Risk that proceeds from a Top-Management overview of the enterprise and its multilayered risk landscape as illustrated below:

Traditional cybersecurity focus   Holistic approach
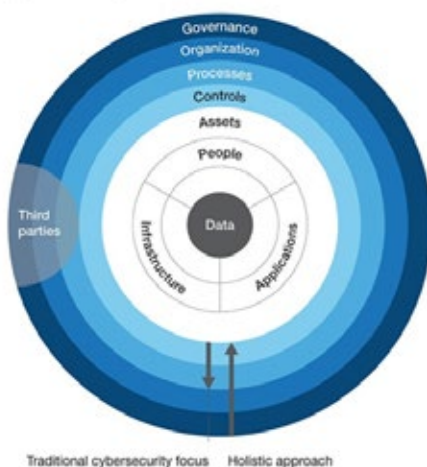
Outcomes:

Assets. Clearly Defined critical assets

Controls. Differentiated controls to balance security with agility

Processes. State of the art Cybersecurity Processes focused on effective responses

Organisation. Right skills, efficient decision making and effective enterprise wide cooperation

Governance. Investment in operational resilience

Third Parties. Coverage of the whole value chain, including 3rd Party services

Cyber-Crime Resilience

We shall implement 360-degree view of the Authority's information security posture. Consequently, we shall review all ICT systems security requirements, improve on existing access and identity management, implement a unified and integrated security solution and collaborate with industry experts and agencies on ICT security matters. The authority shall continue to implement PKI technology for sensitive applications/functions, track biometrics, smart cards and similar technologies to enhance security of our assets. To address data loss in particular the USB security issue, we shall incorporate appropriate new rules in our IT usage policies and guidelines for staff. The threat of unauthorized access to external facing KRA services has increased due to widespread Internet access. Users tend to use easy to remember passwords that create significant security risk. Business managers and mobile teams are requesting network access via various devices. We shall seek to simplify user access to the systems while exploring other secure access solutions to manage the risk. This will also include the Security Operation Centre (SOC) role.

In respect of ICT infrastructure (6.2.3) and information systems risk management (6.2.4), the Authority will pursue the following strategic objective:

Strategic Objective O3: To enhance business systems security, reliability, availability and business continuity

In order to achieve the above objective, the Authority will pursue the following set of strategies and initiatives to achieve the outcomes shown

Strategies	Initiatives	Outputs/Outcomes
S3.1 Upgrade ICT infrastructure	S3.1.1. Upgrade and extend existing IT infrastructure - (including: power backup, Alternate Data Centre/DR site, VOIP, private Cloud, LAN/WAN, data protection & provide universal Wi-Fi access to identified sites) to enhance availability and continuity of business systems	Oc 3.1: 100% availability of service to all KRA footprints
	S3.1.2 Implement Desktop as a Service (DAAS) including centralised computing infrastructure to enhance management of IT services and increase staff to computer ratio	Oc 3.1.2: Ratio 1:1 access to end-user computing device
S3.2 Enhance information systems' security and mitigate cyber threats	S3.2.1 Attain and maintain ISO 27001 certification, acquire external security assurance and collaborate with industry experts on cyber security to mitigate IT risks and exposure to cyber security	Oc 3.2.1.1: ISO 27001 certification attained Oc 3.2.1.2: 80% IT security perception rating score
	S3.2.2 Build capacity in cyber surveillance to support and maintain the Cyber Command Centre/Security Operation Centre (SOC) and digital forensic laboratory for improved cyber surveillance	Oc 3.2.2: 20 trained staff on cyber surveillance
	S3.2.3. Implement single sign on, Web Application Firewall (WAF) and Identity Access tools to enhance secure and ease system access	Oc 3.2.3: 360^0 degree ICT security posture

6.2.5.1 Customer Perspective

Our internal customers are mainly comprised of business departments. Therefore, this perspective concentrates with how best ICT will provide services to the business.   The overarching goal of the Customer pillar in the Seventh Corporate Plan is to 'achieve a quantum leap in customer service'. Chapter four of the 7th Corporate Plan, it is noted that the customer expects better services that are already being offered by ICT. In this regard, ICT will improve its services to meet customers' expectations.

Enhanced User Experience

To enhance user experience, we shall leverage on emerging technology to provide a platform to engage taxpayers. In order to provide a single view of taxpayer, we shall integrate existing systems, and reengineer existing business system to cater for persons with different abilities. We shall build light applications leveraging on mobile USSD and Apps targeting specific sectors to simplify filing and compliance experience.

In line with the overarching goal in the Seventh Corporate Plan and in order to deal with above challenges or needs in the Customer perspective, ICT will pursue the following strategic objective:

Strategic Objective 04: To provide a simple, accessible, standardised and well-coordinated customer service

In order to achieve the above objective, the Authority will pursue the following set of strategies and initiatives and achieve the outcomes indicated:

Strategies	Initiatives	Outputs/Outcomes
S4.1: Enhance User Experience and IT service delivery	S4.1.1. Re-design IT Service Delivery with IT presence in the regions to enhance response time and efficient utilisation of IT services in outstations	Oc 4.1: 100% deployment of IT support staff (IT presence) to all KRA regional offices
	S4.1.2 Upscale/enforce SLA management process to meet the business expectation on IT services	Oc 4.2: 95% IT response Time rating to SLA commitments

Oc 4.3: 80% ICT user satisfaction rating |
| | S4.1.3. Partner with KESRA to impart relevant IT skills to users | Oc 4.4: 70% IT literacy rating |
	S4.1.4 Revamp IT Innovation: R&D functions leverage on emerging technologies to innovate ICT products and services to fill customer-needs gap.	Oc 4.5: 6 IT innovations and 2 IT industry collaborations
	S4.1.5. Implement audio assistance for PWD	Oc 4.6: 1 system with Audio assistant for PWDs
	S4.1.6. Implement sector specific light mobile apps/USSDs	Oc 4.6: 2 USSD/ mobile apps targeting specific sectors

6.2.6 Financial Perspective

This perspective, which the Corporate Plan refers to as Revenue, aims to achieve 'enhanced revenue through improved compliance'. This Strategy will focus on optimizing the IT cost while ensuring that technology standard and quality of services is not impacted. We shall take measures to enhance revenue and/or reduce the cost of ICT by taking measures in ICT project management and IT governance as explained below:

6.2.6.1 ICT Projects Management

e-Project Management

ICT project management is critical to the success of KRA automation initiatives. In order for the project management framework i.e., project management procedures, project discipline in planning, prioritization and selection of ICT projects, & projects closures to be effectively enforced, there is need for improvement. Figure 5 shows project portfolio management proposed.
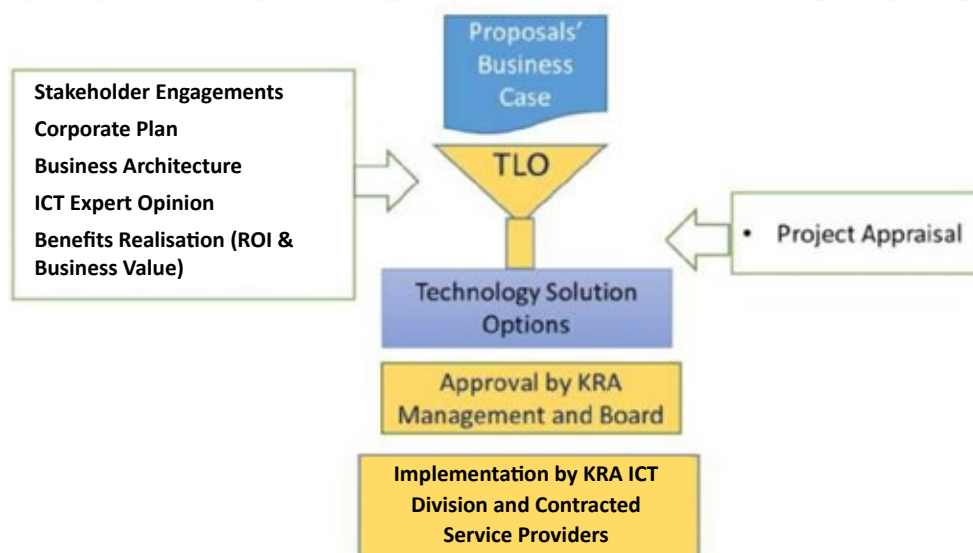
During the Strategy period, we shall facilitate a corporate and departmental mechanism for vetting and accepting ICT projects, skills and knowledge transfer from vendors, with adequate projects documentation while interfacing with stakeholders. There is also need for coordination of project based Change Control Committees (CCC) and Change Advisory Committee (CAC).

Best-Fit Solutions

In implementing the Strategy, the Authority shall adopt project implementation best practices. This will require transition from the traditional waterfall model to an agile project execution approach of prioritizing project products and subjecting them to requirements, design, integration, testing and deployment one at a time and making decisions based on realities during execution. Equally, development of project management skills, practices and standards will be given high attention at the Corporate Level

6.2.6.2 ICT Governance

With the increasing business expectations and the need to get ahead of the curve in order to assure business value, in the spirit of 'IT as a Business Enabler', one of KRA's goals is to embrace and institutionalize IT as a Service (ITaaS) model. We shall make working with and within ICT Department enjoyable by transforming and redefining the ICT function to

bridge the gap between business and ICT, and to improve ICT operations. In business systems management, we shall enhance and efficiently deliver ICT services, while creating convergence of ICT staff and leveraging on outsourcing of services as necessary. To manage the total cost of ownership, we shall negotiate favorable annual maintenance costs at tender level, and shift from outsourcing applications development to a combination of outsourcing and in-house software development. Figure 6 show technology adoption Strategy.
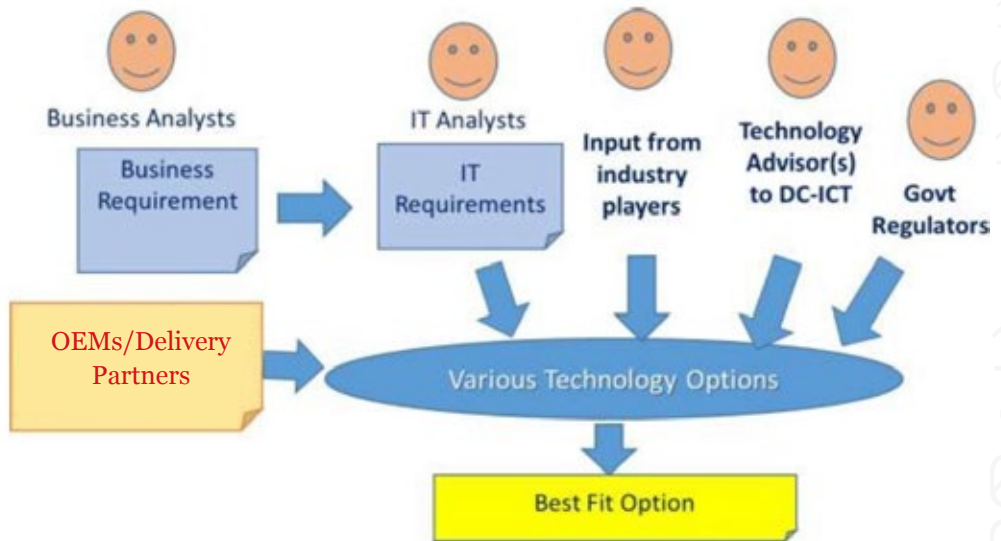
Other opportunities for reducing cost and/or enhancing revenue include effective utilization of redundant links to reduce idle and costly capacity, exploring green alternatives for power to reduce power bills, leveraging on national optic Fibre backbone infrastructure to provide connectivity in KRA regional offices, pursuing development partner funding of some of the ICT initiatives, and consolidating/integrating and completing on-going ICT security projects.

In line with the Seventh Corporate Plan and in order to deal with above challenges or needs in the Financial perspective, KRA will pursue the following strategic objective:

Strategic Objective O5: To optimise the cost of ICT operations

In order to achieve this objective, the Authority will pursue the following set of strategies and initiatives and achieve the outcomes shown:

Strategies	Initiatives	Outputs/Outcomes
S5.1: Manage the cost of ICT operations	S5.1.1: Partner with Manufacturers (OEMs), negotiating volume discounts & manage the project delivery costs	Oc 5.1: 50% of all licensing to be contracted to OEMs
	S5.1.2: Consolidate ICT infrastructure to reduce the costs of licensing and AMC and introduce notional costing for IT services	Oc 5.2: 75% Infrastructure consolidated, 100% allocated notional costing
	S5.1.3: Utilise shared government infrastructure by leveraging on existing ICT infrastructure (e.g. Government Cloud, PKI, government bulk licensing and volume discounts from OEMs)	Oc 5.3: 2 systems hosted in shared infrastructure
S5.2 Develop and implement an ICT project and portfolio management strategy	S5.2.1: Develop and implement ICT investments policy (reduce duplications, increase ROI/benefits, etc.)	Oc 5.4: 100% implementation of the policy
	S5.2.2: Introduce project M&E function to monitor compliance	Oc 5.4: Quarterly reporting on all projects
S5.3: Improve IT governance and upscale value created from IT investments	S5.3.1: Acquire the services an IT advisor on IT projects & investment oversight	Oc 5.5: Contract and onboard an ICT expert
	S5.3.2: Improve IT process maturity rating	Oc 5.6: Attain 3.5 ICT maturity score
	S5.3.3: Benchmark on IT financial management with other Revenue Authorities (RAs), Private Sector, ICTA and OEMs and implement ICT best practices	Oc 5.6: Attain 3.5 ICT maturity score
	S5.3.4: Lobby with government through MOICT, CA and ICTA for appropriate legislation and policies to enhance utilisation of emerging technologies and harnessing big data gains for revenue collection	Oc 5.3.1: 100% engagement of MOICT/ICTA/CA

Financial Perspective

Optimized overall IT Spend

7. Strategy Implementation

7.1. Implementation Plan

An excellent Strategy will not deliver expected results if it is not successfully implemented. The implementation plan for this Strategy is shown in Annex 1. It shows the outcomes, performance indicators for each outcome, targets to be achieved over the plan period, the key initiatives and the offices responsible for achieving the plan. The Division will develop annual work plans, derived from the three-year implementation plan.

7.2. Alignment with Other Internal Components

Successful Strategy implementation requires congruence or alignment with the various other internal components of the division. Key among these are structure, budget, systems, leadership, staff (their skills, attitudes and behavior) and shared values.

7.2.1 Budget Alignment

It will be important to maintain an alignment between the annual budget and the annual ICT work plan developed from the three-year ICT Strategy. Annual work plans should be completed in time to inform the relevant annual budgets.

7.2.2 Structure Alignment

The structure of IT support lacks integration mechanisms, with different units working in silos. An integrated mechanism that coordinates the various units in the Division so that they can work together to support and facilitate business and achieve goals is proposed. Thus there is need to review the current structure and include such integration mechanisms, for instance account managers for specific business departments/divisions who coordinate the various ICT units to provide customer centric services to business.

ICT's reporting level is not commensurate with its strategic role in the Authority. In all similar benchmarked organizations reviewed, ICT is at the same level as revenue departments and reports to the CEO. It is therefore recommended that the ICT structure is reviewed to align to past recommendations and to best practice. By elevating ICT to be headed by a Commissioner, ICT will more effectively interact with business and play the strategic role that ICT is supposed to play in the Authority as an equal partner of business.

The current structure where staff growth is based on managerial structure needs to change to allow critical technical skills that would be crucial to exploit ICT and re-position KRA in its primary business. The recommendation is to implement a technical career path for ICT staff.

In line with the practice in other Revenue Authorities, KRA will implement framework contracts in order source for specialized skills from consultants in order to complement existing ICT capacity.

In reviewing the structure of the ICT organizational structure and right sizing it, the following shall be taken into consideration;

a) The ICT staff to total KRA staff ratio will be used as a key measurement/ performance parameter when compared to comparable tax administrations;

b) Review the existing governance structure for ICT to ensure critical functions/services are handled at commensurately responsible positions, while providing room for growth; and

c) Strengthen the Project Management Office (PMO) function to ensure professional management of ICT projects and get rid of the project management challenges highlighted earlier.

7.3. Communication of the Strategy

Staff in KRA will be involved in implementing the ICT Strategy. In this regard all ICT staff will sensitized and involved in the Strategy execution. This calls for effective mechanisms for communicating the Strategy to all staff in the Division and all other divisions/departments of the Authority.

7.4. Risk Management Framework

Risk-taking in a Strategy is inevitable as the strategies contained therein are enablers of change. Change introduces uncertainty, hence risk. Management of risk is the proactive identification, assessment and control of risks that may affect the delivery of the Strategy's objectives. Bold objectives and attendant strategies are required to ensure risks are managed to minimize their impact, and ensure that the stated objectives are realized. A key tenet of ISO 27001:2013 or ISO 31000, on which the Authority is certified, is the identification of risk, and delineation of mitigation measures. Risk management, therefore, is a continuous activity that must be carried out throughout the life of the Strategy, accounting for changes in the internal and external environments.

The objectives of risk management are to increase the probability and positive impactful events occurring while decreasing the negative events. The team identified a number of risks that are likely to impact the Strategy;

a) First, strategic IT investment push vs budget; therefore the Authority shall enforce IT investment standards.

b) Secondly, escalating cost of IT, due increased automation, software license and related annual maintenance costs.

c) Thirdly, exploitation of emerging technologies gaps arising from the inadequate policy guidelines/legislative provisions; lobby for enactment of pending ICT bills through ICTA & MOICT.

d) Fourth, information systems security risks that impede the user experience of the planned customer centric initiatives.

e) Fifth, the dynamics surrounding the project management culture, leading to low completion rate and delayed value realisation measurement from IT projects; and

f) Lastly, retention of key skills to drive implementation of envisioned strategies due to market dynamics and lack of a structured approach to

retain and motivate ICT talents and innovative skills.

To mitigate these risks, the Authority plans to leverage on the corporate Enterprise Risk Management Framework to profile and mitigate identified risks.

7.5. Monitoring and Evaluation

Monitoring and evaluation (M&E) helps those involved in executing the ICT Strategy to assess if progress being made is in line with expectations of the strategic plan. Monitoring and evaluation of performance shall be the responsibility of those who are closely involved in the implementation of the Strategy.

In this regard, the ICT Division Head and identified stakeholders shall carry out quarterly self-assessment of performance and provide proofs of compliance. They will be expected to have the capacity to conduct self-assessment of performance and will be given the responsibility to undertake performance measurements and reporting. In addition, the Strategy, Innovation & Project Management and Strategy, Innovation and Business Perspective Unit in ICT Division will take lead in the role of monitoring and evaluation

The Division and its constituent units will implement the Strategy through performance contracts. The Division will monitor implementation of the Strategy on a monthly basis, which will be consolidated to quarterly and annual progress. The agreed performance indicators and targets at all levels will be used for benchmarking of this evaluation. The outcome of the annual evaluation will form a basis for the following year's plan.

7.6. Budget Implications

Table 6.4 show the total financial implications of the selected key initiatives for each balanced score card perspective. The cost of each key initiative is shown in the Implementation Plan (Annex 1).

Tables 2: Budget Implications for Each Perspective

Balanced Score Card Perspective	Estimated Budget (KShs m)
1. People	84.0
2. Business Processes	2,554.6
3. Customer	64.0
4. Financial	23.5
Total	**2,726.1**