

New Technologies Mean New Opportunities For African Tax Administrations

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In this article, the authors consider how African tax administrations can use technology to improve tax collection processes, promote compliance, and increase revenues, using Kenya and Uganda as case studies to support recommendations for the region.

This article synthesizes the ideas in the first talk in a series entitled “Talking Tax: An African Perspective,” which took place July 6, 2020. In the discussion, Owens was joined by Elizabeth Meyo, the deputy commissioner of domestic taxes with the Kenya Revenue Authority, and James Odong, the assistant commissioner of process management with the Uganda Revenue Authority. The views expressed in this article are solely those of the authors and do not necessarily reflect those of their employers or organizations.

If one is looking for success stories about technology and tax, African jurisdictions should

feature prominently on the list. Recent experience in several African countries showcases how new technology can help transform tax systems and tax administrations. In some countries, including Kenya and Uganda, the proliferation of mobile money services has created new opportunities to simplify the taxation of small and medium-size enterprises that operate in the digital world. Beyond the taxation of mobile money, tax authorities are beginning to evaluate the type of data that they collect and how it can be used to enhance compliance and improve tax investigations. South Africa and Nigeria are among the countries taking advantage of new access to abundant data sources and building technical platforms to collect, store, and analyze information. These platforms help the authorities develop a more sophisticated approach to risk management, which in turn leads to a more effective use of resources. Therefore, amid the rapid growth of digitalization across the globe, it is particularly important for African countries to continue to adopt new solutions, explore innovative ways to improve the effectiveness and efficiency of tax collection, and promote the digitalization of their societies.

Drawing on the work of the Vienna University of Economics and Business Global Tax Policy Center (WU GTPC) at the Institute for Austrian and International Tax Law, this article explores how technology can help resolve some of the problems that have plagued African economies for decades. Kenya and Uganda are among the leaders in the effort to digitalize African tax administrations. Therefore, representatives of those countries — Elizabeth Meyo, deputy commissioner of domestic taxes at the Kenya Revenue Authority (KRA), and James Odong, assistant commissioner of process management at the Uganda Revenue Authority — joined Jeffrey

Owens (coauthor of this article) as the guest speakers for the first in a series of events entitled “Talking Tax: An African Perspective,” which took place July 6, 2020.

The series is part of an ongoing project on tax, transparency, and corruption conducted at the WU GTPC. The project builds on the outcomes of the three-year Tax and Good Governance Project in Africa (2015-2018).¹ The earlier project brought together 35 African countries and more than 700 participants from tax and customs administrations, financial intelligence units, law enforcement agencies, justice departments, central banks, international and regional organizations, and civil societies.

Section I of this article outlines how African tax administrations can use new technologies, pointing out some issues that can be addressed and resolved using digital tools. Section II focuses on Kenya and Uganda, describing how their tax administrations have adopted (and continue to adopt) new technology. Section III draws on these experiences to consider best practices and lessons learned, and it presents some ideas regarding the use of more advanced solutions — such as blockchain and artificial intelligence — that may be key to shaping the tax administration of the future.

I. Technology and African Tax Agencies

A. New Technologies Help SMEs

The new wave of technologies holds an enormous potential to improve the efficiency of public administration in Africa by, *inter alia*, decreasing tax compliance costs and helping to fight corruption, problems that have long diminished the region’s potential. According to the IMF, increased digitalization is associated with a reduction in perceived corruption and an

increase in public trust of tax officials.² The internet is rapidly evolving from a medium focused on information exchange to a tool for value exchange. Finding, accessing, transacting, paying, and settling with counterparties worldwide is becoming frictionless thanks to digital technologies.³ This environment offers African SMEs the opportunity to operate globally and in direct contact with consumers, without barriers and at low cost.

Digitalization is rapidly changing business models, including those established in Africa. While it remains unclear how these new transactions will be regulated and taxed and who will be held responsible for meeting standard obligations, the technology itself may offer a solution that improves compliance and adjusts systems for this new environment.

Many African SMEs are digital natives — they exist only in the cloud. They hope to create tradable liquid markets in established industries that were dominated by intermediaries and to make inroads into industries in which effective trading was not feasible in the past. The rapid rise of digital commerce will fuel this trend — Amazon and Alibaba alone account for over \$200 billion in sales each year,⁴ and that number is growing by more than 40 percent annually.

B. Digital Solutions for Systematic Issues

The need to respond to the health and economic crises caused by the COVID-19 pandemic and the desire to achieve the U.N.’s sustainable development goals have provided a new sense of urgency for African tax administrations as they develop digital tools. New technologies can improve the capacities of tax administrations, financial intelligence units, and other law enforcement agencies that are key in the fight against illicit financial flows. Those same technologies can help improve the services that tax administrations provide to taxpayers

¹The earlier project, like the ongoing series, was financed by the Integrity Initiative of Siemens AG, in cooperation with the World Bank, U.N. Office on Drugs and Crime, and African Tax Institute. The project culminated in a report: WU GTPC and African Tax Institute, “Tax and Good Governance 2015-2018” (Feb. 2018). The second phase of this effort will examine the issues raised by beneficial ownership, the attorney-client privilege, and the relationship between government and citizens. See also WU GTPC, “Tax Transparency and Corruption (2019-2023)” (last accessed Dec. 2020).

²Rasmané Ouedraogo and Amadou N. Sy, “Can Digitalization Help Deter Corruption in Africa?” IMF Working Paper No. 20/68 (May 29, 2020).

³David Deputy, Griffin Andersen, and Błażej Kuźniacki, “Toward Frictionless Trade and Frictionless Compliance: The Challenges and Opportunities of Blockchain,” *Tax Notes Int’l*, May 14, 2018, p. 853.

⁴Juozas Kaziuškėnas, “Amazon GMV in 2019,” *Marketplace Pulse*, Feb. 4, 2020.

whether by employing call centers, using chatbots, or moving toward electronic assessment and pre-populated tax returns.

Few would deny that African countries, like the vast majority of developed economies, have been dealing with increasing inequality. This is not just a moral or social issue — it is also an economic issue. Work by the IMF and OECD shows that income and wealth inequality contribute to reduced social cohesion, which in turn makes it more difficult to build the political support needed for growth-enhancing structural policies. Governments have the power to reverse this trend if they wish to do so, using a variety of tools such as education, social spending, regulations, and taxes. In terms of taxes, governments should reexamine the traditional arguments against inheritance tax, net wealth taxes, and taxes on capital gains in light of the enormous progress in tax transparency, including new track-and-trace technologies that can handle trillions of bits of information and increasingly sophisticated risk-profiling tools.

Not only do new technologies offer less-developed countries a way to secure more revenues, but they can also help address corruption by reducing physical contact, making it easier to identify who has access to files, and providing more secure storage. Technology can also improve government accountability.

Traditionally, most compliance processes have been conducted after the transaction has taken place, often three months to five years later. The embedded transparency in blockchain and other technologies can move tax compliance into real time, which may improve tax certainty for the taxpayer and reduce the risk of fraud.⁵ Blockchain could significantly improve and speed up this process by guaranteeing that payments from the taxpayer to the state are automated and tracked in real time, at the moment that the transaction is being executed. This is achieved using smart contracts, which are pieces of code programmed to self-execute when a set of predefined conditions is satisfied.

⁵ See, e.g., Alicja Majdanska, Clement Migai, and Marta Olowka, “High-Net-Worth Individuals: The Challenge for Tax Administrations, Financial Intelligence Units and Law Enforcement Agencies,” 72(10) *Bull. Int’l Tax’n* 595 (Oct. 2018).

Further, in order to detect fraud, governments can use AI and machine learning to enhance risk profiling and identify high-risk sectors and taxpayers.⁶

C. Addressing Capacity Constraints

Both companies and governments can benefit from new technology.

In a global economy involving \$75 trillion, tax collection stands at approximately \$11 trillion. Estimates suggest there is a tax gap of up to \$4 trillion. The digital technologies that are disrupting business operations and changing traditional tax compliance may also present opportunities to enhance efficiency and improve collections by African tax and customs authorities. In a keynote speech that opened the Fourth International Conference on Tax in Africa, Ugandan President Yoweri Museveni underscored the need for African countries to actively invest in strategies aimed at increasing tax revenue.⁷ He noted that digital transactions are always traceable electronically and commended the use of digital stamps in the production process to reduce smuggling.

With the rapid development of technology and the digitalization of the economy, the efficiency of tax systems relies on not only robust tax policy and legal frameworks but also effective collection mechanisms and a transparent system. The success of the U.N.’s sustainable development goals depends on African countries mobilizing their tax systems. COVID-19 has made this even more difficult, with many African countries experiencing a fall of more than 15 percent in taxes remitted. Therefore, the time is ripe to take the opportunities offered by digitalization.

When reforming tax rules, especially in developing countries, administrations should consider the special needs of their unique jurisdiction. African countries are at different stages of implementation and development in relation to a wide range of technologies and digital solutions. Digitalization is not restricted to

⁶ See WU GTPC, “Blockchain 101 for Governments,” note prepared for the 15th session of the U.N. Committee of Experts on International Cooperation in Tax Matters (Oct. 17-20, 2017).

⁷ African Tax Administration Forum, “Outcome Statement: Fourth International Conference on Tax in Africa” (Nov. 21, 2019).

a specific group of countries or companies — it affects the entire region and the global economy. Each region requires its own roadmap that addresses strategies, the legal framework, and capacity-building needs in a smooth manner and takes advantage of the new wave of technologies. The biggest challenges facing tax administrations involve identifying the right combination of technologies, selecting the criteria to use when making these choices, and determining how to transition from analog systems to digital solutions while protecting government revenue.

II. Case Studies From Kenya and Uganda

In recent years, tax administrations in many sub-Saharan African countries have adopted new digital tools to improve taxpayer service and compliance. The biggest advantage of the African region lies in lack of legacy technologies and the presence of a young, technology-savvy population that is willing to embrace new technologies. In this environment, digitalization is transforming how tax administrations operate, helping to improve efficiency and service delivery while reducing the opportunities for corruption.⁸

Nevertheless, while technology can create new ways to counter illicit financial flows, including tax evasion, it also opens new opportunities for cybercrime, the misuse of cryptocurrencies, and the risk that tax administrations may be hacked.

There are a broad range of available technologies and different levels of implementation and development among the African countries. Looking at two African countries — Kenya and Uganda — and their experience with digitalization of tax administration will provide insight into how technology can be implemented and used in practice.

A. Kenya

The KRA has been investing in technology for the past six years. Not only does this process entail investments in software, but it also means changing the overall approach to the KRA's work and its employee demographics. Seventy percent

of the KRA's staff is young and technology-savvy. This transformation is a part of broader government efforts, but the KRA is ahead of the curve compared with other government agencies. Examples of the KRA's efforts include using online platforms to ease congestion in tax service offices, thus reducing the time taxpayers spend waiting in line, and enabling the use of mobile money to pay for transactions, something 1.6 million people are already doing. Taxpayers can even use a mobile app to pay the taxes through a platform known as the KRA M-Service.⁹

Notably, the M-Service is not the only digitalized entity within the KRA. Customs is an integrated part of the agency, and it has developed a system to clear goods before they arrive at the port, as well as an electronic system to track cargo.¹⁰ The KRA has invested time and resources to set up innovative systems, implement procedures, and adopt new strategies aimed at enhancing the operational efficiency of the agency's processes, including those of the customs services department. In line with these goals, Kenya has introduced electronic filing for customs documents.

According to the KRA's Fourth Corporate Plan, which covered 2009/10 to 2011/12, a central pillar of a reliable customs administration is a stable automated information technology system that can facilitate rapid cargo clearance and electronic exchange of data with the trading community. The KRA will soon replace SIMBA 2005, an internet-based customs IT system introduced in 2005, with a more advanced information and communications technology solution that uses a single-window platform to clear customs. The process has already begun with the introduction of an integrated customs management system, which monitors imports and exports, and an excise goods management system.

Kenya has also developed a digital mechanism for dispute resolution, which uses emails, webinars for taxpayer education, and video conferences. The entire process has become

⁹ For more information, see KRA, "KRA Mobile Services" (last accessed Dec. 2020).

¹⁰ See also "Maersk, IBM to Launch Blockchain-Based Platform for Global Trade," TradeMark East Africa (Jan. 2018).

⁸ Sanjeev Gupta et al., *Digital Revolutions in Public Finance* (2017).

more interactive and less costly because there is no need to send officers into the field.

The KRA has been using digital surveys to monitor taxpayers' satisfaction with the new solutions, and most reactions have been positive. Not only can taxpayers evaluate changes after the fact, but taxpayers are also notified before a solution is introduced and given an opportunity to express their opinions if they so desire. Therefore, input from taxpayers provides an incentive for transformation, which in turn encourages taxpayer engagement and ultimately increases compliance. The only aspect that still brings concerns is confidentiality. Kenya has a legal obligation to keep information secure and, therefore, security features are included in the system. There have been no leaks thus far.

An evaluation of the KRA's systems conducted after the June 2020 tax return filing cycle revealed improvement. This is particularly notable because many expected the satisfaction level to decrease in light of the impact of the pandemic.

New technologies were also used to help respond to COVID-19. For example, chatbots were used to help taxpayers update information, and mobile platforms were used for registration, tax return filing, and payment of taxes. The use of pre-filled returns was extended and an e-invoicing system — a game changer in terms of VAT compliance — was implemented. Overall, the ease of doing business increased, making the country more competitive, which also incentivizes taxpayers to file returns and make the right declarations. The plan is to digitalize the risk management system soon, which will use AI and user-risk profiling to help identify cases for audit. Finally, the KRA is working closely with the IMF on an online mechanism for collecting the newly designed digital service tax, which entered into force on January 1.¹¹

The next step for the KRA is to explore the use of robotics, which Meyo noted during the initial "Talking Tax: An African Perspective" event. The KRA is initially using external technology providers because of a lack of internal capacity,

but the internal technical staff is being trained and should be able to take over this job in the future. Thus far, technology is not compatible across agencies, but there is an ongoing effort to integrate those systems.

Notably, people appear to be more willing to pay taxes when they see that government is fulfilling its promises.

B. Uganda

The transformation of the Uganda Revenue Service (URS) has its roots in 2005. Since then, 1.5 million taxpayers have registered online. The URS provides an integrated electronic tax system for the core domestic activities of registration, audit, refunds, filing, and payment. The presence of real-time revenue reconciliation suggests that there is even an electronic payment acknowledgment system.

Various online payment channels exist in Uganda, including electronic funds transfers, the Society for Worldwide Interbank Financial Telecommunications system, mobile money, internet banking, point-of-sale terminals, checks, and cash. During the COVID-19 outbreak, tax payments using online card systems and mobile money have increased significantly, with several million taxpayers coming on board. The declaration function is now purely online for all tax types; since November 2009, over 5 million declarations have been filed online. Now, the URS is focused on providing pre-populated returns for taxpayers. All the changes that have been introduced are aimed at transforming and significantly improving the taxpayer's experience.

Concerns about the integrity of the system remain. A key focus is ensuring the systems are integrated and information is up to date. The tax registration function is only semi-automated — taxpayers can file applications and submit additional information online, but this function has not been integrated with registration. Some Ugandan taxpayers — approximately 1 percent — do not have internet access; internet penetration stands at about 38 to 39 percent across the country, but access is available in most trading areas, even rural ones. Most local governments have connectivity.

An important part of Uganda's digital transformation involves the employees of the

¹¹ See also KRA, "Introducing Digital Service Tax" (last accessed Jan. 2021).

URS. Even though the profile of an employee has not changed significantly, technology has become an integral part of the onboarding program. Moreover, the recruitment process is no longer limited to lawyers or accountants because increasing numbers of IT-trained personnel are joining the organization. A fully functioning IT unit has been developed and is still expanding.

The five-year strategy plan set to be achieved by 2024 assumes increasing revenues, and it targets changes in the ways that revenue is obtained by lifting burdens, enhancing transparency and accountability, and improving taxpayer services and education. The plan also assumes that the URS will develop more advanced digital solutions using AI to detect noncompliance and blockchain technology for registration purposes. A task force that is focused on a governmentwide approach to adopting new technologies includes a group that deals directly with digitalizing tax administrations.

III. Tax in Africa: The Future

A. Achieving Better Compliance

During the Fourth International Conference on Tax in Africa, participating countries agreed that while innovations such as digital transactions, digital platforms, and online data complicate tax collection and enforcement, they also present opportunities for tax administrations to use technology to improve service delivery, encourage voluntary compliance, and increase tax collections. Participants urged African countries to embrace the new technologies of the Fourth Industrial Revolution, including blockchain and AI, and explore how the technologies can help tax administrations operate efficiently and effectively.¹² Moreover, the group encouraged countries to learn from each other's data analytics systems and processes that are in use across the continent and beyond. Innovative solutions offer great potential to the African tax administrations of the future.

¹² African Tax Administration Forum, *supra* note 7.

1. Using Blockchain

The hallmarks of blockchain — trust and transparency — make it a perfect fit for the tax arena.¹³ Weaving compliance into the fabric of a blockchain solution offers automation, improves transparency, and provides assurance that clear-cut rules will be enforced. Blockchain-based businesses offer tax administrations a unique opportunity to rethink the nature of compliance, potentially moving from a regime of periodic payments and reporting that uses audits as the main enforcement mechanism to a system in which payments and information flow in real time, and monitoring or control is built into it so that the system itself becomes the primary enforcement mechanism. Moreover, the transparency, immutability, and security that blockchain offers means it is ideally suited for use in recordkeeping, particularly for information regarding the ownership of assets.

2. Mobile Money

Many forms of illicit financial flows thrive when cash is the main means of exchange. If African governments can gradually move toward a cashless society, the shift will encourage citizens to move from the informal economy to the formal economy and, thus, reduce the opportunities for money laundering, bribery, corruption, and tax evasion.

According to the OECD, mobile money platforms can facilitate the registration of payments and transactions, thus opening opportunities for real-time reporting that were nonexistent in the cash era.¹⁴ The governance and security measures that are a fundamental part of payment systems make it more difficult for businesses to underreport. Moreover, third-party information from mobile payment service providers may also make fraudulent activities easier to detect. As a result, integrating mobile money systems with tax systems can facilitate real-time reporting, curb underreporting, and detect and prevent fraud.

¹³ See Owens and Julia de Jong, "Taxation on the Blockchain: Opportunities and Challenges," *Tax Notes Int'l*, Aug. 7, 2017, p. 601.

¹⁴ OECD, "Chapter 3: Evolving E-Commerce Business Models," in *Unpacking E-Commerce: Business Models, Trends and Policies* (2019).

Mobile money service providers are inherently connected to the banking system: They all hold bank accounts in which the equivalent of the virtual money is held. Transitioning the banking and finance industries onto a blockchain will, therefore, have spillover effects on the mobile money sector. Although mobile money platforms and the underlying transactional data have the potential to ensure tax compliance by design, mobile money service providers typically hold the records centrally. Transitioning to a blockchain will provide an immutable, time-stamped, transparent, and real-time record of transactions that tax administrations can trust. The link between blockchain and mobile money is even more beneficial for tax administrations when it comes to hard-to-tax enterprises, SMEs, and the informal sector because it would ensure that transactional-level data would be available in a transparent and immutable record.

3. AI, Predictive Analytics, and Big Data

Complying with complex tax rules and systems can be difficult for both taxpayers and tax administrations, especially when cross-border business activities are involved. In this case, AI can make frictionless compliance a reality. AI can use detailed information flowing to tax administrations in real time to determine potential income tax obligations, including domestic obligations as well as international obligations stemming from tax treaties. Increasingly, AI agents use deep learning and artificial neural networks to undertake tasks that were unimaginable less than a decade ago. Ultimately, AI can learn to perform compliance-related tasks, such as recognizing when an arrangement lacks any economic substance.

The high-quality, detailed, and company-specific data collected via blockchain, from companies themselves (by country-by-country reporting, master and local files, and information exchange mechanisms), and from existing audit files will enable tax administrations to train AI engines to assist tax lawyers, multinational enterprises, governments, judges, and others in examining transactions, including those that may violate antiavoidance rules.

4. Interagency Cooperation

The IMF research shows that despite devoting large amounts of resources to new IT systems,

many tax administrations still do not routinely compile data and share it internally among different units.¹⁵ Technology could help facilitate cooperation between the different government entities — including customs, tax, social security, financial intelligence units, justice departments, and finance ministries — that are engaged in countering all forms of illicit financial flows.

A joint report¹⁶ from the World Bank and WU Global Tax Policy Center shows how this can be done in practice, but one issue remains: In most African countries, the technical platforms used by the different departments are incompatible, which makes information sharing difficult. When departments upgrade their technology, they must do so in a coordinated fashion.

IV. Policy Recommendations

Data and digital government can do a lot in the fight against corruption, but it can only go as far as the legal framework allows it. Incorporating new technologies is only truly beneficial if it is accompanied by a supportive legal and political environment. Nonetheless, it is very likely that jurisdictions that embrace new and secure technologies will have a structural advantage. Therefore, an internationally developed agreement establishing basic standards for system architecture and a legal framework suitable for the digitized economy is necessary.

Local and regional characteristics must be kept in mind when developing technological solutions. In particular, jurisdictions that have not begun to digitalize their tax administrations should identify potential issues and consider suitable technologies that could provide tailor-made solutions.

Ensuring transparency and enabling the cross-border flow of information are invaluable goals that can facilitate interagency cooperation. Technology is still developing, and many questions remain unanswered. Issues such as legal liability, privacy, security, authentication,

¹⁵ IMF, “Current Challenges in Revenue Mobilization — Improving Tax Compliance” (Jan. 29, 2015).

¹⁶ Owens, Joy Waruguru Ndubai, and Siddhesh Rao, “Chapter 10: Exchange and Collaboration with Tax Administrations — Case Studies,” in *Enhancing Government Effectiveness and Transparency: The Fight Against Corruption* (Sept. 2020).

authority, and scalability still need to be addressed. But this should not stop African tax administrations from implementing new technology-based solutions. All these concerns can be addressed if tax administrations engage with businesses and other taxpayers to develop platforms that meet the needs of all parties involved.

Finally, government policies play an important role in promoting information and communications technology, not only in terms of enacting regulations but also in ensuring that staff members receive suitable education and that up-to-date tools are made available to them.

V. Conclusion

African tax administrations need to integrate existing technology with a vision for the future in which digital compliance is a natural part of business operations for businesses of all sizes and for both domestic and cross-border transactions, with blockchain and AI forming the core of this transformation. Technology — including tools we know today and those we haven't even imagined yet — offers exciting opportunities for African tax administrations and policymakers to provide a business-friendly environment that stimulates growth, increases revenue, and reduces the dead-weight loss associated with complex tax systems. Importantly, it can also be used to reduce inequalities and open new tax policy options for African governments.

Notably, the problems in the existing tax systems and collection mechanisms extend beyond technical issues and often involve the political and organizational capacities of tax administrations and governments as a whole.¹⁷ Richard Bird elaborates on this point:

Experience around the world demonstrates that the single most important ingredient required for effective tax administration is clear recognition at high political levels of the importance of the task and willingness to support good administrative practices and managing cultural attitudes.¹⁸

The work of the WU GTPC Tax and Good Governance Project has helped achieve this goal. If the political will exists, wise use of available technology can be a key feature in building an effective tax administration, reducing corruption, curbing evasion, and improving revenue yields. ■

¹⁷ Mick Moore and Wilson Prichard, "How Can Governments of Low-Income Countries Collect More Tax Revenue?" International Centre for Tax and Development Working Paper 70 (Nov. 2017).

¹⁸ Richard Bird, "Tax Challenges Facing Developing Countries," Institute for International Business Working Paper No. 9 (Mar. 2008).