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Committee of Experts on International Cooperation in Tax Matters
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Item 3(k) of the provisional agenda
Digitalization and Other Opportunities to Improve Tax Administration

Co-Coordinator's Report

Summary

This report is presented for ***discussion and approval*** at the Twenty-eighth Session of the Committee. It outlines the work carried out by the group on Digitalization and Other Opportunities to Improve Tax Administration in furtherance of its mandate and plan of work.

The report includes an annex containing the draft Guide to Digitalization of Revenue Authorities.

The group presents ***for first reading and discussion*** Chapter 1 (introduction), Part 2 on Legal Governance Framework (i.e. Chapters 3 and 4), Part 4 on Innovative Technologies (Chapter 7) and Annex 1 containing Case Studies from different jurisdictions.

Based on the discussion at this Session and any subsequent written comments, the group will further revise the Chapters now submitted for first reading, with a view to submitting them to the Twenty-ninth Session for discussion and approval.

Background

1.   At the Twenty-third Session of the Committee in October 2021, the Secretariat provided a paper on Digitalization and Other Opportunities to Improve Tax Administration E/C.18/2021/CRP.30. That paper highlighted issues for consideration in assisting tax authorities to digitalize their operations and improve administration of taxes. At that session the Committee established a group on Digitalization and Other Opportunities to Improve Tax Administration to review the work done in other forums on the digitalization of tax administration and, in so doing, identify any existing gaps in this work and consider the possible value the Committee could add to this work, as well as consider other means of improving tax administration.

2.   In subsequent meetings, the working group reported on its proposed (and now approved) workplan, and the progress made thus far. See the following relevant documents for reference:

- Report on the twenty-third session

- E/C.18/2022/CRP.11 - Co-Coordinator's report presented to the Twenty-fourth Session.

- Report on the Twenty-fourth Session.

- E/C.18/2022/CRP .33 - Co-Coordinator's report presented to the Twenty-fifth Session.

- Report on the Twenty-fifth Session

- E/C.18/2023/CRP .4 - Co-Coordinator's report presented to the Twenty-sixth Session.

- Report on the Twenty-sixth Session.

- E/C.18/2023/CRP.33 - Co-Coordinator's report presented to the Twenty-sixth Session.

- Report on the twenty-seventh Session.

3.   At the Twenty-fifth Session, the Committee approved the proposal to develop a UN Guide to Digitalization of Revenue Authorities. At the Twenty-seventh Session, the Committee approved Chapter 2 of the Guide - Digital Tax Administration Roadmap and considered for a second reading the draft Part 3 of the Guide - Data Governance Framework.

Meetings of the Working Group

4.   The group held three virtual meetings on 15 November 2023, 25 January 2024, and 22- 23 February 2024 to discuss the identified workstreams to fulfill the mandate of the working group. This report reflects the outcome of those discussions.

5.   The group discussed the feedback received from the Twenty-seventh Session.

6.   Participants noted that there were no further inputs or remarks on Part 3 – Data Governance Framework - after the second reading, and it was agreed that this would be submitted to the Committee at the Twenty-Eighth Session for possible approval.

7.   The group considered the remaining parts of the guide and discussed the various drafts that were still under development, that is;

- Chapter 1 (introduction),

- Part 2 on Legal Governance Framework (i.e. Chapters 3 and 4),

- Part 4 on Innovative Technologies (Chapter 7) and

- Various Case Studies on the process of digitalization highlighting the experience of various countries in introducing and implementing digital tools in tax administration.

8.   Participants noted that Part 4 was initially split into two chapters to cover Innovative technologies and using the new technologies for administrative purposes, but it was agreed to merge the two and discuss the issues as one for better flow and coherence of the guide.

ISSUES

9.   The Committee is asked to provide feedback and give input to the following parts of the draft Guide;

- Chapter 1 – Introduction and Overview (Annex 1),
- Part 2 - Legal Governance Framework comprising Chapters 3 and 4 (Annex 2),
- Part 4 - Innovative Technologies comprising Chapter 7 (Annex 3), and
- Case Studies from different jurisdictions (Annex 4).

NEXT STEPS

10.   Upon consideration by the Committee of the submitted Chapters, the working group will incorporate the input and feedback received at the Twenty-eighth Session and prepare the Chapters for a second reading and approval at the upcoming Sessions.

11.   Below see a matrix illustrating the progress of the draft guide and the projected timelines.

Part	Chapter	Content	Status
1 - Digital Tax Administration Roadmap	1	Introduction and overview	Submitted to the 28th Session for first reading
	2	Developing a roadmap to digitalization	Approved at the 27th Session
2 - Legal Framework	3	Review of Existing Laws	Submitted to the 28th Session for first reading
	4	Introducing New Laws	
3. Data Governance Framework	5	Data Collection	Presented at the 27th Session for second reading; to be presented at the 29th Session for approval
	6	Use of Data	
4. Innovative Technologies	7	Innovative Technologies	Submitted to the 28th Session for first reading
Outline of the Guide			To be presented at the 29th Session
Case studies		Case Studies	Submitted to the 28th Session for first reading

ANNEX 1 – CHAPTER 1

PART 1 – DIGITAL TAX ADMINISTRATION ROADMAP

In recent years, an increasingly connected digital society has been reshaping the economy by creating new products, services and business models. The whole global economy is rapidly becoming a digitalized new economy, so original commercial channels have been developing while unfamiliar ways to produce, consume, work and earn are being taken in place. Disruptive technologies are changing the way taxpayers and tax authorities interact and altering the way taxes are paid and information is stored and used. From this perspective, no tax administration is released and all need to address this challenge in a cooperative manner. Also developing countries are prompted to deal with this, despite difficulties such as lack of resources could obstruct or slow down the process.

Tax administrations are facing more and more challenges to keep up with technological development and globalization in the performance of their tax functions. Emerging technology such as big data, data analytics, artificial intelligence and machine learning have penetrated and disrupted the way tax administrations traditionally function at an unprecedented scale and speed.

By adopting appropriate technologies and designing whole new procedures and structures, together with instituting ways to monitor and measure their operations and performances through best practices, tax authorities will increase their efficiency and organization of work progress. Such huge transformation necessarily should lead to new ways to engage taxpayers bringing out a major improve in voluntary compliance, enhancing trust and contributing to a better revenue collection.

To ensure a successful digital transformation, administrations should take a strategic rather than opportunistic approach to digitalization; thus, before beginning the process of digitalization, tax administrations should develop a digital tax administration roadmap (i.e., a step-by-step plan of principles to be followed) having in mind the long-term goals of the administration and the government in general.

When designing a digital roadmap, several factors should be considered such as the legal framework of the country in which the administration is inserted, the technological availability of resources, the cost of adopting new technologies, the adequacy of each technological tool to deliver the desirable result, and the objectives of each tax administration. And while use of Information and Communication Technology (ICT) present many opportunities to Tax Authorities, challenges remain and are mostly related to the collection and use/management of data, the respect of due process and taxpayers' rights, budget constraints and lack of digital skills among the tax authority's personnel.

The aim of Part 1 of the UN Guide to Digitalization of Revenue Authorities is to highlight, based on best practices and experiences from tax administrations, the environment and conditions for a successful digital transformation and the principles to follow when building a digital tax administration roadmap, as well as the constraints faced by authorities when implementing digital tools. This part comprises two chapters; 1.) Introduction and overview and 2.) Developing a roadmap to digitalization.

CHAPTER 1 – INTRODUCTION AND OVERVIEW

Digitalization of a tax administration refers to the conversion of data into digital formats, and the automation of manual processes. But beyond that, it also means moving from basic to more advanced and efficient forms of digital operation, such as replacing segregated ICT systems with a single integrated system, or fully automating semi-automated processes. Digitalization also has the capacity to provide tax administrators and taxpayers with new innovative tools that are integrated and automatic.

Developing countries need to finance the spending necessary for sustainable development, with domestic revenue mobilization (DRM) critical to achieving that goal. In the quest to mobilize more resources to finance public expenditures for economic and social development, it is important that governments design effective tax systems that will facilitate the achievement of DRM. Well-planned, efficient, and equitable taxation helps to pursue economic growth, reduce inequalities, combat poverty, and provide social services. A key component of efficient tax systems is digitalization. Manual processes and procedures limit the efficiency of tax administrations and greater efficiency could be achieving by digitalizing these processes. Moreover, in an increasingly digitalized business environment, tax administrations need to digitalize their processes to effectively tax digitalized businesses.

Information and Communication Technology (ICT) has made technologies cheaper, more powerful, and widely standardized, improving business processes and bolstering innovation across all sectors of the economy. As a result of this, the economy has become digitalized, changing many business models and giving rise to new ones.

Rapid technological change is taking place globally due to the development of new instruments and techniques, their creative deployment and application. External events, such as the COVID-19 pandemic, have also accelerated their demand and enhanced their use cases. Tax administrations around the world have also embarked on individual journeys of transformation and digitalization, benefitting from this technology boom.

Tax administrations need to adopt some of these technologies, as they realise the benefit of doing so in keeping up with the changing business scene as well as effective taxation of the digitalised economy, which is becoming the mainstream economy. The Covid-19 pandemic has accelerated this transformation and many businesses have had to become digitalized to remain relevant and afloat. Over this period, many tax administrations have had to move many of their processes online as the pandemic stopped many manual process that required physical presence.

A survey by the OECD Forum on Tax Administration (FTA)[1] completed by some of its members showed that this move allowed them to substitute in-person communication with a virtual or digital means during the crisis and shift a significant percentage of communications from paper to digital, in many cases 75% or more. This development was further reinforced during the crisis. While about half of the administrations considered their digital channels sufficient to deal with the increased demand, the others addressed shortcomings through introducing enhancements to existing services or by developing new services such as applications and virtual assistants.

For improved revenue collection, it is important for tax authorities to improve administrative efficiency. Use of information technology enables the authorities achieve substantial efficiency gains. For countries beginning their digital transformation, AI-enabled data capture of paper-based records can speed up the digitalization and reliability of the data. Others find significant value through the simplification of procedures and matching of filing information with third-party data sets.

For more advanced tax administrations, the use of advanced analytics to identify underreporting will be a key value driver. Following the COVID outbreak, some administrations are also rethinking their balance between offsite and onsite audits. It also becomes easier to implement the one-stop-shop concept, making it easier for taxpayers to be tax compliant.

Further, it is important that tax authorities seek to minimize the compliance burden for taxpayers. A survey of 190 economies has shown that it is getting easier for people and businesses to pay taxes. There are now 106 economies using electronic filing systems, double the number in 2004[2]. Digital technology is reducing the time spent on paying taxes, as well as the total number of individual payments taxpayers must make each year.

1.1. Importance of Digitalization

The COVID-19 pandemic accelerated the adoption of digital technology by governments, including in tax administration. As economies recover, tax authorities can reform their operations to bolster tax collection and tax compliance which declined during the pandemic. In an ideal fully digitized tax administration, technology tools may address the leakages in the revenue pipe by changing the paradigm for how a tax administration operates (e.g.,

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[1] Tax Administration: Digital Resilience in the COVID-19 Environment (reference document, PDF, webbook), published 21 April 2021

[2] https://www.pwc.com/gx/en/services/tax/publications/paying-taxes-2020.html

implementing direct streaming tax at the taxable event – making tax invisible to the taxpayer or part of broader government services to citizens).

Digitalization of tax administration offers an opportunity to improve the efficiency and effectiveness of tax collection, allowing tax authorities to process and manage large amounts of data quickly and accurately. This can reduce the burden on taxpayers, making it easier for them to comply with their tax obligations and free up time and energy for other productive endeavours. Efficiency and effectiveness are further increased by reducing human intervention and error and improving targeted case selection for monitoring and audit implementation.

It can help to increase revenue for the government, by making it easier to identify and collect taxes that are owed, and at lower cost, and support investment in public services and sustainable development. Additionally, digitalization can help to reduce the potential for corruption and improve transparency in tax administration, by providing a clear and auditable record of tax transactions. Tax administration reform through digital transformation provides an opportunity to rethink the role and sources of data and the taxpayer experience — both critical components in the compliance process.

Further, by putting strong digital systems in place, more effective data security measures may be implemented, safeguarding private taxpayer data and financial records. This works to improve compliance as digital technology can make it simpler to monitor and enforce tax laws, which will help to guarantee that taxpayers comply with the law more closely. Digitalized often leads to improved and better taxpayer services. The public can experience an easier tax filing process with the use of digital platforms, which can provide enhanced services to taxpayers like online filing, electronic payments, and self-service alternatives.

Digitalization encourages accountability by giving real-time access to tax and financial data. This may improve revenue authorities' accountability as well increase tax transparency as tax authorities have access to and can share tax information with other jurisdictions. In a digitalized environment, revenue authorities can make decisions more quickly and intelligently when they have access to real-time data and analytics. These decisions include targeted interventions such as audits and compliance checks. Revenue agencies must change in order to remain relevant and efficient at a time of fast technological improvement. Digitalization allows revenue authorities to keep up to date with the ever-changing business environment and effectively tax a more digitalized business environment.

By creating a roadmap to digitalization, revenue authorities plan for their needs and can remain competitive internationally by adopting and learning from global best practices in digitalization. As the economy expands, they are able to manage ever-increasing volumes of

data and transactions because digital solutions are frequently more scalable. Digitalization also assists in disaster recovery and business continuity. By integrating strong disaster recovery plans into their digital systems, revenue authorities may guarantee that their activities will not stop in the event of an unforeseen circumstance.

As a result therefore, digital tax administration can:
- Result in new access to taxpayers (e.g., via new channels or additional information),
- Allow the delivery of new services to taxpayers (e.g., to reduce or eliminate compliance burdens, deliver incentives or reliefs, provide information and answers, etc.), and
- Increase the quantity and accuracy of data collected (e.g., by providing new methods and sources for cross checking data).
- Analysis of information arising from such measures may help the tax administration to better understand and relate to taxpayers.
- Finally, developing an effective digital tax administration can also act as a catalyst for increasing wider digitalization across government, improving the provision of (non-tax) public services to citizens, opening new opportunities for economic growth and driving other positive changes in a society.

Beyond these specific benefits, digital tax administration tools have the potential to radically enhance the taxpayer experience by reducing compliance costs dramatically and increasing accessibility to information and tax administration support. Taken in combination, digitization of tax administration could have strong impact both on compliance and supervision which could have a positive effect on revenue generation.

The World Bank argues[3] that modern revenue strategies, to a large extent, need to run on digital platforms because they are necessary to effectively pursue critical policy objectives including:
- **Broadening the tax base**. Data-centric approaches can be used to close gaps and take advantage of missed opportunities without necessarily increasing the level of taxation. Such measures include requiring e-commerce platforms to report sales to facilitate the collection of Value-Added Tax (VAT) and customs duties; analyzing past tax filings of citizens seeking relief under current stimulus programs to verify compliance; and supporting the collection of property taxes by matching the land registry with the taxpayer file.
- **Enhancing transparency and trust**. Establishing electronic platforms for tax registration, filing, payment, and dispute resolution makes processes clear for citizens,

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[3] Marcello Estevão (2020), *Why digital transformation matters for taxation*, Why digital transformation matters for taxation (worldbank.org)

provide assurances that tax payments received in an actual government account, and reduce the risk of officials abusing their discretion.

- **Reducing the compliance burden**. By 2020, there were 106 economies that used electronic filing systems, double the number in 2004.[4] Digital technology is reducing the time spent on paying taxes as well as the total number of individual payments taxpayers must make each year.

- **Improving administrative efficiency**. As governments mature in their use of information technology, they will be able to achieve substantial efficiency gains. For countries beginning their digital transformation, AI-enabled data capture of paper-based records can speed up the digitalization and reliability of the data. Others find significant value through the simplification of procedures and matching of filing information with third-party data sets.

- **Digital methods can also be substantially cheaper for governments to operate than the various analogue or partially analogue methods**. One Australian estimate showed that, for every Australian dollar spent on digital service provision, the same service would cost 16 times more to process over the phone, 32 times to deal with by post and 42 times in person.[5]

- **Advancing growth and other policy objectives**. As a central repository of tax and non- tax data, tax administrations play an increasing role in advancing non-tax related objectives. For example, by using taxpayer data (with sufficient data privacy rules in place) to verify beneficiaries under cash transfer programs, monitor the consumption of goods with detrimental health impacts (e.g., alcohol and cigarettes), model tax policy responses to curb carbon emissions, identify growth drivers in the economy, detect labour market violations, and ascertain the well-being of vulnerable groups in society.

In addition, technological solutions that target big data handling, accuracy, efficiency, and speed offer the possibility of attacking old tax administration problems with new tools. For example:

- Increasing taxpayer visibility (e.g., by development of a unique unified government-issued ID (such as a taxpayer identification number (TIN), use of automated third-party data, or other measures) can allow better targeting of non-compliant entities with greater accuracy. This enhanced ability to identify

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[4] Ibid.

[5] CAEW (2022), *Digitalisation of tax, international perspectives*, Digitalisation of tax, international perspectives

taxpayers offers new possibilities to tackle issues such as identifying shadow economy non-compliance.

- Better targeted supervision and audit using predictive technology (e.g., Artificial Intelligence (AI)) to model taxpayer behaviour, calibrate risk assessments, and better target enforcement.

- Simple digital solutions such as using digital document recognition for paper processes can reduce mistakes, increase accuracy, efficiency, and speed of processing. However, a more sophisticated process of using real-time third-party data may eliminate the need for some paper processes altogether.

In addition to the above benefits, the FTA has identified four key areas in which digitisation may specifically benefit the tax administrations of developing countries[6]:

- **By increasing revenue** through expanding the tax base, or through more effective collection, supervision, and enforcement.

- **By increasing efficiency and effectiveness** through simplifying processes, using cheaper and more accessible digital channels to interact with taxpayers, moving to more self-service approaches, and effectively exploiting data to focus resources more effectively. In the case of some countries, digital tax administration may allow delivery of services that might not be able to be delivered or accessible to some taxpayers via another channel.

- **By reducing the administrative burden on taxpayers** by making it easier to comply with obligations, in some cases by building taxation processes into the processes that people and entities use in their everyday lives and businesses.

- **By helping to drive meaningful change in society.** Tax administration is one of the largest government functions, and the drive towards a digital tax administration can help increase wider digitalization across government and across society. In turn, this could open new opportunities for economic growth.

The figure below illustrates what a future digital tax administration may look like:

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[6] OECD (2021), *Supporting the Digitalisation of Developing Country Tax Administrations*, https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/supporting-the-digitalisation-of- developing-country-tax-administrations.pdf
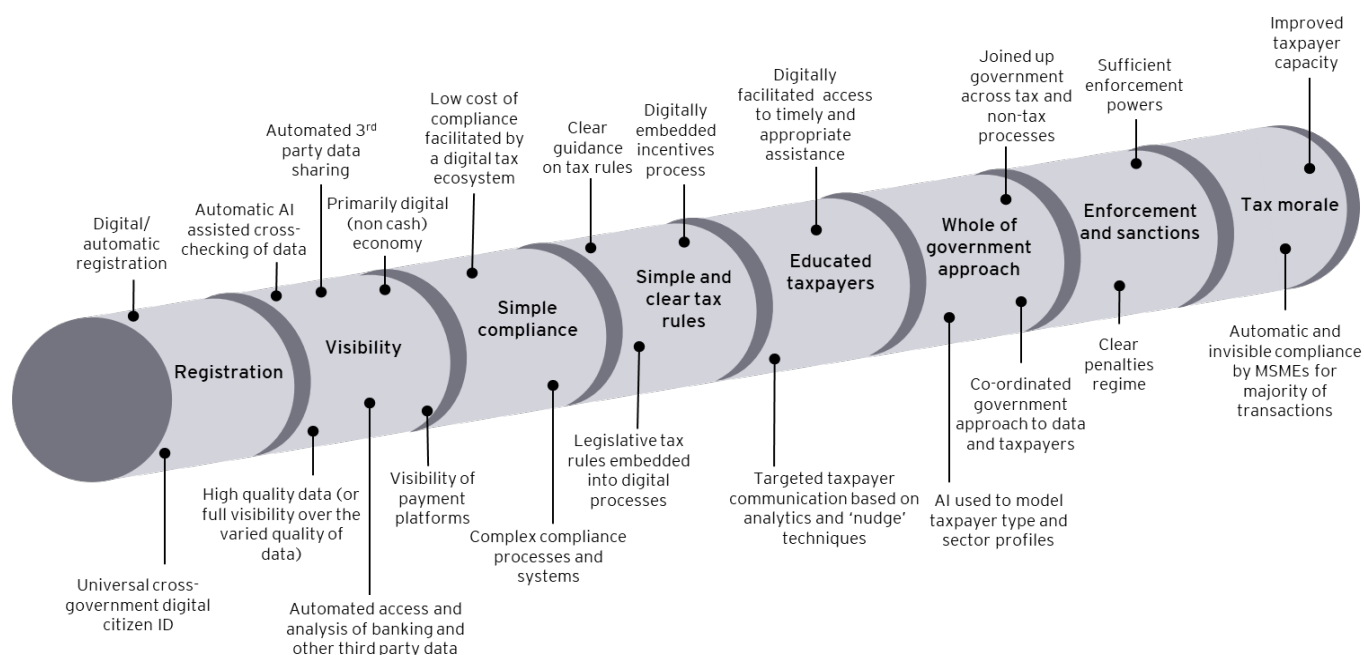
Source: Sanger, Stern, St John, EY, 2021

1.2. Challenges Faced by Countries in Digitalization

In the quest for digitalization, revenue authorities face a number of challenges. A number of these challenges will be heightened for developing countries.

1.2.1 Existing electronic systems and integrating legacy systems

Most countries already have some electronic element to their tax administration. Integrating new digital systems with these older technologies can be complex and may require substantial investment and planning. However, some developing countries may benefit from a 'blank slate' approach if they do not have as many existing complex systems that need to be integrated into new technology or replaced. This can allow such countries to leapfrog digital tax administration efforts in high income countries as there may be less costly and cumbersome integration and data migration processes.

1.2.2 Data security and privacy:

Digitalization involves the storage and processing of sensitive taxpayer information, hence ensuring the privacy and confidentiality of taxpayer information becomes critical. Digital platforms are susceptible to cyber threats and attacks. Revenue authorities deal with sensitive financial data, and any breach could lead to unauthorized access, data manipulation, or theft. Ensuring robust cybersecurity measures is crucial to protect against data breaches and unauthorized access. Data security and privacy require a fully specified legal foundation, covering data protection, along with procedures and protocols in place to specify access, accountability, and enforcement measures for breaches (including protections from hacking).

Striking a balance between efficient data management and safeguarding individuals' privacy is a challenge.

1.2.3   Capacity

Most countries, regardless of the level of development, will face constraints such as funding, technology capacity, and data management capabilities. However, these limitations can be severe in developing countries[7]. Lack of capacity and resources can impact the ability to carry out 'normal' tax administration and the increasing requirements of international commitments (such as tax transparency measures). The introduction of digital tax transformation can stretch limited resources even thinner before efficiency gains are seen.

The initial cost of implementing digital systems, including software, hardware, and training, can be high. Securing budgetary allocations and managing costs effectively are ongoing challenges. Digital transformation solutions intended to reduce the need for human intervention can require the development of new skills to run new systems. Consideration of how capacity will be allocated and retained should be a critical part of the cost-benefit analysis of a digital transformation program.

Limited taxpayer capacity can also magnify risks and can result in low levels of uptake or compliance for digital measures, particularly for more complex taxes. Ensuring that all segments of the population have equal access to digital services can be challenging. This includes addressing issues related to digital literacy, language barriers, and accessibility for people with disabilities.

1.2.4   Technological depth and absorption

Developing countries face two different but related types of challenges regarding baseline digital capability:
  a.) The tax administration itself may currently make limited use of technology due to any number of reasons, such as funding or strategic priority.
  b.) Taxpayers may not have access to, or the ability to use, the technology implemented due to a variety of reasons (e.g., lack of financial resources or lack of infrastructure such as internet coverage). If taxpayers do not have reliable digital access, the implementation of a digital tax administration will be more challenging. Also, socioeconomic disparities may lead to a digital divide, where certain segments of the population lack access to digital tools. This can result in inequitable access to tax services and information.

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[7] Haque, Knight, and Jayasurya (2015), "Capacity Constraints in Public Financial Management in Pacific States". In Asia and Pacific Policy Studies, https://onlinelibrary.wiley.com/doi/epdf/10.1002/app5.79   P.612

However, the growth in mobile technology globally is reducing these barriers. Greater and more widespread access to internet in developing countries continues to grow, alongside the use of new mobile-based electronic payment systems. This is increasing access for taxpayers who may not have previously had a traditional bank account. Educating users about new digital processes, filing methods, and online tools is crucial for widespread adoption

In addition, the COVID-19 pandemic accelerated, mostly due to necessity, the adoption of digital technology by society as well as by tax administrations and governments, in both developing and developed countries. While this acceleration and some of the resulting transformation was ad hoc and unplanned, it provides an opportunity to leverage the progress made, and plan the way forward in a more strategic manner. This leap in technology also creates opportunities for tax administrations.

Where a tax administration implements a digital transformation, taxpayers may not be able to participate, access or provide data. Where this is the case, a digital transformation program will need to include measures to address taxpayers who may not be able to access digital tools or processes (e.g., accessibility measures or collection of data from alternative sources).

1.2.5   Availability and accessibility of data

An important driver of efficiency is the ability for a tax administration to use different external sources of data relating to taxpayers (e.g., banking information, customs information, and other third-party information for profiling and adjudicating arms-length pricing). In developing countries, data is not always available and in many instances the data needs to go through a form of cleaning to ensure that it is accurate and up to date. Ensuring the accuracy and integrity of digital data is essential for reliable tax collection. Issues such as data entry errors, system glitches, or manipulation risks need to be addressed to maintain trust in the system.

Tax administrations can adopt internal digital tools that streamline, simplify, and make better use of internal or third- party data (e.g., cross checking of data, and development of a universal whole of government digital identification number). This can lead to significant improvements, irrespective of the technology uptake in a country. Technology adoption itself can often also drive improvements to data quality and management; for example, e-invoicing can lead to the adoption of systems with more rigorous processes.

Security of data should be central to a project, given the increasing access to private information, analysis and conclusions that might be drawn. Strict legal frameworks and provisions should set out when data are able to be collected, and how may be used.

1.2.6 Governance and transparency

Governance and transparency issues can be a serious challenge to implementation of digital tax initiatives in developing countries[8]. For a successful digital transformation, procedures and tax treatment should be designed with good governance, compliance, and transparency at the centre. Without proper legal basis for digital projects establishing, responsibility, reporting and processes digital tools may be open to abuse and taxpayer trust may be eroded.

Digital transformation can also in itself increase transparency and strengthen governance through "seamless" compliance by design (e.g., data streaming in real time).

1.2.7 Identification of taxpayers

Visibility over taxpayers, and the ability to monitor and enforce compliance are key precursors to any digital tax administration (whether in a developed or developing country). An International Labour Organization Report published in 2018 found that over two thirds of those employed in developing countries are in informal employment. This type of employment is more likely to be hidden from taxation, but digitalization can help to resolve these issues by creating links between tax administrations and employers[9], and using new methods for identifying taxpayers and economic activity.

1.2.8 Change management and adoption of technology:

The right environment is required to manage, train and make the best use of new processes and technologies. Employees and stakeholders may resist the shift from traditional manual processes to digital systems due to concerns about job security, unfamiliarity with new technologies, or resistance to change in general. Training programs and change management strategies are essential to address resistance and ensure a smooth transition.

1.2.9 Future proofing:

This refers to ensuring that change done today is relevant in the future. This is particularly important for developing countries which may have constrained future capacity or resources to change systems.

1.2.10 Legal and Regulatory Framework:

Adapting legal and regulatory frameworks to accommodate digital processes can be challenging. Ensuring that digital transactions comply with existing tax laws and regulations is crucial. Keeping up with evolving tax regulations and compliance requirements can be

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[8] Dickinson (OECD, 2011), Tax and Good Governance in OECD Journal: General Papers, Volume 2010 Issue 1, pp. 69-76.

[9] OECD (2021), Supporting the Digitalisation of Developing Country Tax Administrations, Forum on Tax Administrations, OECD, Paris

challenging. Digital systems must be adaptable and regularly updated to align with changing legal frameworks. The digitalization of revenue authorities may also face political opposition beside the legal challenges. Clear policies and legal frameworks need to be established to support the digital transformation and address any potential controversies.

1.2.11   Digital Infrastructure

Some regions may lack the necessary digital infrastructure for seamless implementation. This includes reliable internet connectivity, access to digital devices, and IT infrastructure. Revenue authorities must ensure that their digital systems are reliable and available at all times. Downtime or system failures can have significant consequences on revenue collection and taxpayer services.

Addressing these challenges requires a comprehensive approach that involves technological solutions, stakeholder engagement, and strategic planning to ensure the successful digitalization of revenue authorities.

ANNEX 2: PART 2

PART 2 – LEGAL FRAMEWORK

Tax Administrations around the world have at least one common goal: to increase tax revenue. In the digital era, it is safe to say that it is very difficult, if not impossible, to achieve such a goal without the inclusion or improvement of digital processes and elements in the services provided by Tax Administrations. This Guide proposes to look specifically at the considerations, essential elements and possible stages and contextual analysis in the process of digitalizing a Tax Administration.

In this unavoidable context of the "4th Industrial Revolution", which has been substantially disruptive for workflow processes and structures of all kinds, traditional ways of collecting taxes, registering and communicating with taxpayers, protecting and increasing countries' expected tax revenues, protecting taxpayer rights, and enforcing tax laws have been dramatically changing in the last decades. Governments in general and Tax Administrations specifically, are globally concerned with and already in some stage of addressing these changes through introducing or improving existing digital processes and tools in their operations and structure.

Every substantial change through history demanded from lawmakers major legal developments and adaptations on institutions' standards and regulations. In the pursuit to digitalizing its Tax Administrations, different countries may face several hurdles depending on the level and structure of their IT's infrastructures, connectivity and energy supplies. Thus, challenges in digitalizing Tax Administrations and the approaches taken to address such challenges will differ from country to country. Strong domestic laws create a strong framework for a Tax Administration to have a successful digitalization process, as all existing and new processes and tools must be legally bound to safeguard its effectiveness, especially if they are aligned with the Government's administrative and constitutional principles but aligned with the modern digital business models and needs.

This part is focused on addressing the possible legal framework adjustments and considerations a Tax Administration is to undergo when intending to digitalize (or increase its digitalization levels) responding to the needs of the current and future digitalized global economy. It comprises of two chapters, that is, 3.) Review of existing Laws and 4.) New and Updated Laws.

CHAPTER 3: REVIEW OF EXISTING LAWS

3.1.   Introduction

Tax Administrations around the world have at least one common goal: to increase tax revenue. In the digital era, it is safe to say that it is very difficult, if not impossible, to achieve such a goal without the inclusion or improvement of digital processes and elements in the services provided by Tax Administrations. In this unavoidable context of the "4th Industrial Revolution[1]", which has been substantially disruptive for workflow processes and structures of all kinds, traditional ways of collecting taxes, registering and communicating with taxpayers, protecting and increasing countries' expected tax revenues, protecting taxpayer rights, and enforcing tax laws have been dramatically changing in the last decades. Governments in general and Tax Administrations specifically, are globally concerned with and already in some stage of addressing these changes through introducing or improving existing digital processes and tools in their operations and structure. Therefore, creating a legal infrastructure for legal issues is critical to ensure that the necessary regulatory framework exists to enable digital transformation while protecting citizens' rights and define the standards of "what can and cannot be done"[2].

Every substantial change through history demanded from lawmakers major legal developments and adaptations on institutions' standards and regulations. In the pursuit of digitalizing its Tax Administrations, different countries may face several hurdles depending on the level and structure of their IT's infrastructures, connectivity and energy supplies. Thus, challenges in digitalizing Tax Administrations and the approaches taken to address such challenges will differ from country to country. Strong domestic laws create a strong framework for a Tax Administration to have a successful digitalization process, as all existing and new processes and tools must be legally bound to safeguard its effectiveness, especially if they are aligned with the Government's administrative and constitutional principles but aligned with the modern digital business models and needs.

Notwithstanding the expected challenges in this process, digitalization does not require extensive designated legislation, rather, legislation to ensure the recognition of electronic identities/signatures and electronic documents. This can be done through special laws or amendment to existing laws, like administrative and criminal procedure legislation and contract

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[1] Fourth Industrial Revolution has been named by WEF's Chair, Klaus Schwab, to describe the process of rapid social, industrial and tech patterns disruption derived from smart automation and huge interconnectivity. Main known features are data, genetic and robotic sciences advances, and their effects in the world shape.

[2] https://hdr.undp.org/system/files/documents/2020nhdrmontenegropdf.pdf

law, including the necessary attention to the protection of taxpayer rights and privacy, including specifically data protection.[3] This section is focused on addressing the possible legal framework adjustments and considerations a Tax Administration is to undergo when intending to digitalize (or increase its digitalization levels) responding to the needs of the current and future digitalized global economy.

3.1.1. Government Functions and Tax Administration's (Tax Administration) Structure

3.1.1.1. *Government digitalization and TAs' "centrality" within this process.*

As TAs are in most of the countries specially professionally shaped and technologically advanced agencies within the Administration, it is also common that digitalization processes at any stage are being leaded or at list strongly assisted by these. As public digitalization is a process following the actual digitalization of the economy, several items arise when it comes on how other administrative agencies or areas has to interact with citizens "outside" the TA. Usually it takes sooner or later the need for a central government policy effort.

3.1.1.2. *TAs' structure and functions overhaul*

New staff profiles are needed (data analysts, etc.) and new structures to rely on need to be built (data warehouse administration, international cooperation experts, etc.). This may lead to a new legal environment for the TA. As digitalization envisages every aspect of people in their relationships (economical, political, even taxing life) it may be necessary to look at the Legal environment holistically and thus Law and Human Rights issues become more and more relevant.

In this environment, transparency emerges as a major feature to be guaranteed by TAs in the process of legal reform. Being transparent assures Administrations' efficiency, accuracy and goal driven activity, alongside with safeguard for Human Resources. Also, as the whole process means a real challenge for TAs as Organization, plus with the development of whole new processes, functions, structures and rules as main results

3.1.1.3. *Risk assessment:*
- Upstream compliance activities: (i) facilitate tax compliance; (ii) information – filing's faster processing; (iii) fast appealing resolution/verdict/ruling.

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[3] https://ega.ee/wp-content/uploads/2019/04/eGA_Final-Report-Research-analysis-guidelines-and-roadmap-for-full-deployment-of-e-governance-systems-in-Af.pdf

- Downstream compliance activities: (i) real time control/ enablement for filing/registering/submitting requests, etc; (ii) [Big Data/AI/Machine Learning

3.1.1.4. *Data/Information management/governance:*

During the past Century, regulations in the use of data for TA's were mostly related to fiscal secrecy concerns. Recently, some new challenges and controversial situations (e.g., International Tax Dodging by wealthy people or MNEs, terrorism and other crimes, social policies research or implementation activities addressed by using available tax information) have led to reconsider the use of data by TAs. Alongside, Tax Cooperation Instruments usually charge TAs on mandatory secrecy rules regarding the information surrounding cooperation activities (i.e., exchange of information, documentation validation, cross -border debt recovery, etc.).

Now then, big data and other IT tools have produced *new* data from inside the TAs –e.g., risk profiles, behavioural insights data- and outside TAs –e.g., standardized public financial information; global behavioural warnings about TPs, etc.-. That *new data* is not contained in TPs' filling submitted files and therefore are not subject to tax secrecy rules in many Countries. A guidance on digitalization for TAs may address this to advise them on the new stakes they've to deal with. Special approach on whether confidentiality, use and exchange of information and IT tools (AI, big data, etc.) interact is expected to be an outcome if this chapter.

3.1.2. Constitutional and Human Rights considerations

With a change in framework frequently come situations that relate to data usage, sharing and management, and alongside will come human and confidentiality rights' concerns, especially regarding the avoidance of arbitral situations or situations where sensitive information is handled. Taxpayer's information and tax administration data in general are subject to regulatory frameworks usually under the country's domestic laws, which includes the Constitution. The main guarantees and rights are amongst many, non-discrimination rules, right to petition the authorities, recognition of legal personality, full exercise of economic rights.

These rights must be guaranteed in a digital environment too (e.g., necessary fulfilment requisites over documentation required to make an e-submission are usually settled so petition is not deemed as submitted before several verification [programs] are correctly [running]. On the other hand, Administrations' digital processes are designed and developed to better gather information/revenue from TPs *with less human resources interaction costs*. There is a need for guarantee both the right to be heard and the TA's efficiency work and revenue protection.

3.1.3. Preliminary research on existing legal framework

Prior to reviewing legal systems and deciding on how to go about or the extent of possible changes to the legal framework of the administration of tax revenues, it is essential that Tax Administrations consider important aspects of their current framework against intended changes, such as:

    a.   Current guidance on tax law compliance and deadlines.

    b.   Current guidance on filing and payment deadlines (manual and e-filing).

    c.   Existing data protection rules.

    d.   Existing information sharing regulations.

    e.   Existing e-invoicing and e-payment regulations.

    f.   Hardware and software requirement rules.

Specific analysis of legal frameworks relating to the levels of digitalization of countries around the world, are not readily available. However, the World Economic Forum has dedicated separate efforts to highlighting the importance of regulatory environments in their Global Information Technology Report 2016[4]. Although the Report is not tax specific, Annex 9 depicts the analysis of the performance of the regulatory environment of African countries, and its index measures the quality of regulations pertaining to ICTs, the capacity and the role of ICTs in driving innovation and represents the level of sophistication for ICT related laws in a country.

3.2. Phasing Off Legislation

In the transformative journey towards digitalization of revenue authorities, a critical step involves a meticulous review of existing legislation. This chapter focuses on specific laws that demand scrutiny and potential elimination to pave the way for a more agile and technologically adept revenue management system.

Below are steps in the process of eliminating legislation in the process of digitalization of the Revenue Administrations:

3.2.1. Identifying Outdated Laws

In the transformative journey towards digitalization of revenue authorities, a critical step involves a meticulous review of existing legislation. This chapter focuses on specific laws that demand scrutiny and potential elimination to pave the way for a more agile and technologically adept revenue management system.

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[4] 5 http://reports.weforum.org/global-information-technology-report-2016/

3.2.1.1. Legacy Tax Codes

The digitization process should be undertaken hand in hand with legal compliance, such that technologies and procedures implemented do not infringe on taxpayer guarantees and are generally law abiding. The process for ensuring legal compliance should thus begin with the assessment of the tax codes and applicable regulations designed for a pre-digital era. Revenue Administrations should strive to identify clauses and provisions that may hinder the smooth transition to digital processes.

Once identified, eliminating outdated laws is crucial for the successful digitalization of revenue authorities. Some examples of categories of laws that may need review or elimination to facilitate the process:

a. *Paper-Dependent Laws:*

In this process Revenue Administrations identify and eliminate laws that mandate or heavily rely on paper documentation for tax filing and record-keeping. On the other hand, Revenue Administrations introduce legislation which encourages the adoption of electronic documentation.

b. *Inflexible Reporting Requirements:*

Revenue Administrations revise laws that stipulate rigid reporting formats and frequencies. The aim is to allow for more flexible reporting requirements that can accommodate digital systems and real-time data.

c. *Obsolete Technology Standards:*

Revenue Administrations evaluate laws that specify outdated technology standards. It is essential to update these standards to align with modern technology, especially ensuring compatibility with digital systems to be implemented as the Revenue Administrations moves towards digitalization.

d. *Manual Verification Mandates:*

Requirements for manual verification of transactions are also reviewed in the digitalization process. Revenue Administrations move towards implementing laws that support the use of advanced technologies such as AI and machine learning for efficient and accurate verification processes. This is discussed in further detail in Chapter 7.

e. *Geographical Constraints:*

As Revenue Administrations become more digitalized, its services may experience an extension of reach beyond geographical limits, optimizing on technology that allows for joint cross-border audits, exchange, and processing of information from taxpayers' global

operations, transfer pricing audits, dispute resolution and many more services. These services may, however, be conditioned by geography or jurisdictional legal restrictions. Before laws can be updated to permit expansion of the services of a Revenue Administration to cross-border services, such laws that limit revenue authorities to specific geographical locations are to be reassessed. This is to say, within the bounds of its tax sovereignty. Ideally, Revenue Administrations will foster laws that enable remote access and digital collaboration and function beyond physical boundaries.

f.   Non-Interoperable Systems:

Another important concern is to address laws that contribute to the existence of non-interoperable systems within the revenue authority. This will promote legislation that mandates compatibility and seamless integration between different digital platforms.

g.   Bureaucracy and complexity of Tax Codes:

To ensure efficiency in the digitalization process, it is essential to simplify and streamline tax codes in order to make them more understandable and adaptable to digital processes. This involves eliminating unnecessary complexity that may hinder the implementation of user-friendly digital interfaces.

h.   Lack of Electronic Signature Recognition:

A crucial step is to include or modify laws that recognize and accept electronic signatures as legally binding. This can enable the use of digital signatures for authentication in electronic transactions.

i.   Outdated Security Standards:

Laws that prescribe outdated cybersecurity standards should ideally be eliminated. Revenue Administrations therefore seek to adhere to legislation that permits the use of the latest cybersecurity measures against cyber threats.

j.   Manual Audit Requirements:

Laws that mandate manual audits should also be revised, to promote the use of data analytics and digital tools that facilitate more efficient and accurate auditing processes.

k.   Limited Cross-Agency Data Sharing:

Cross-agency data sharing can be pivotal in making business processes more efficient in a digital Revenue Administration. Where possible, it is ideal to remove legal barriers that hinder the sharing of relevant data between revenue authorities and other government agencies. Consequently, countries ought to foster a legal framework that supports secure and authorized

information exchange, within the regulatory and constitutional taxpayer information protection.

This list is not exhaustive, and the specific laws to be eliminated or amended will depend on the existing legal framework of the jurisdiction in question. It's essential to conduct a thorough legal review in collaboration with legal experts to identify and address the most pertinent issues.

3.2.2. Key Considerations for Legislative changes towards Digitalization

Finally, resulting from the analysis of the considerations above, Revenue Administrations may find the need to eliminate certain legislation, a necessary step to modernizing and digitalizing its business. In deciding which laws are to be eliminated, below are some considerations to be made in the analysis of the current status of the regulatory framework:

3.2.2.1. *Relevance Assessment:*

Digitalization calls for a thorough examination of existing legislation to determine its relevance is the contemporary landscape. Assessing the alignment of current laws with digital processes is paramount. Legislation that impedes the seamless integration of technology or lacks compatibility with emerging digital platforms should be flagged for reconsideration.

3.2.2.2. *Flexibility and Adaptability:*

An essential criterion for legislation survival in the digital era is its flexibility and adaptability. Laws that demonstrate rigidity and inhibit the swift adoption of technological advancements may hinder progress. The chapter explores strategies for identifying and amending such inflexible regulations to create a legal framework that accommodates innovation and rapid changes in the digital landscape.

3.2.2.3. *Cybersecurity and confidentiality:*

Cybersecurity and confidentiality are key elements of legal compliance in any process that is data and information intensive. As such, robust measures must be in place to safeguard both the transition for digitalization, as well as the new digitalized structure the Revenue Authority will be expected to have at the end of this process. This is especially the case of the protection of sensitive taxpayer identification and financial information. Countries which in general observe a large number of cyber protection legislation, may be particularly interested in reviewing the extent and relevance of such a framework against the backdrop of digital integration and innovation.

According to The Global Information Technology Report 2016[5], several African countries have designated data protection legislation, often designed similarly to European laws (which are similar between European countries, based on EU rules as well as common principles provided by other organizations). Others may have data protection as part of general privacy rules, for instance as constitutional provisions, in various laws or in sub-legal acts, A majority of African countries have no designated legislation or authorities for data protection and in many countries, the number of provisions in other (non-specific) legislation is also limited.

3.2.2.4. Enhancing Operational Efficiency:

The digitalization process aims at enhancing operational efficiency within revenue authorities. Legislation that introduces unnecessary bureaucratic processes or impedes the smooth flow of digital operations may need reconsideration. This chapter discusses how streamlining legislation can contribute to a more efficient and responsive revenue management system.

3.2.2.5. Stakeholder Consultation and Communication:

A crucial aspect of eliminating legislation is engaging with stakeholders to ensure a transparent and inclusive decision-making process. The chapter explores effective communication strategies and methodologies for obtaining feedback from key stakeholders, including tax professionals, legal experts, and the general public, in order to make informed decisions about which laws to eliminate.

3.2.2.6. Legal Risk Mitigation:

The digitalization process introduces new legal risks and challenges. This section provides insights into identifying potential legal pitfalls and crafting strategies for mitigating risks associated with eliminating legislation. It also addresses the importance of creating a legal framework that aligns with international best practices and standards.

3.2.2.7. Accessibility and Inclusivity

Some key considerations with regard to accessibility and inclusivity would be:
- How can digitalization enhance accessibility and inclusivity?
- What amendments can be proposed to promote the development of user-friendly interfaces and services accessible to a broad demographic?

3.2.2.8. Collaboration and Information Sharing

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[5] 5 http://reports.weforum.org/global-information-technology-report-2016/

It is important to ensure that the Laws in place facilitate collaboration and information sharing between revenue authorities, government agencies, and private entities, and in the event that they do not, plan to incorporate these elements when overhauling the legal framework. Further it is important to break down silos for a more interconnected financial ecosystem and therefore a review of the laws to determine the bureaucracies is vital.

3.2.2.9.   Training and Capacity Building

Frequent regulatory changes may cause a dynamic scenario within implementing agencies such as Revenue Administrations. Although these changes to tax codes may be advisable and necessary for digital transformation, it is crucial that staff are capacitated regularly, as the ultimate agents to use such policies in their daily operations. The increase of staff adequate ICT skills is an essential step for the success of the digitalization process and ensuring its longevity.

3.2.2.10.   Outdated Tax Codes:

The digital landscape often outpaces the evolution of traditional tax codes. This section emphasizes the importance of revisiting and updating tax laws to accommodate the complexities of digital transactions, e-commerce, and emerging business models. Outdated tax codes can hinder the effective implementation of digital systems, and their elimination is crucial for maintaining relevance in a rapidly evolving economic environment.

3.2.2.11.   Paper-Centric Regulations:

Laws that mandate paper-based documentation and manual record-keeping processes can impede the efficiency gains promised by digitalization. This part of the chapter explores the necessity of eliminating regulations that require physical paperwork and encourages the adoption of digital record-keeping practices, facilitating a smoother transition into a digital revenue management framework.

3.2.2.12.   Obsolete Compliance Procedures:

The digitalization process demands streamlined and efficient compliance procedures. This section identifies laws that impose outdated or overly complex compliance requirements, hindering the agility of revenue authorities. By eliminating such regulations, revenue administrations can enhance compliance processes, making them more accessible, transparent, and user-friendly for taxpayers.

3.2.2.13.   Rigid Data Protection Laws:

With the rising importance of data in revenue management, laws governing data protection need to be dynamic and adaptable. This chapter segment explores the need for reviewing and eliminating rigid data protection laws that may stifle the implementation of innovative digital

solutions. Crafting legislation that balances data privacy with the efficiency of digital processes is essential for a successful digitalization strategy.

3.2.2.14. Bureaucratic Approval Processes:

Cumbersome approval processes and bureaucratic red tape can impede the swift adoption of digital technologies. The chapter delves into identifying laws that contribute to unnecessary delays in decision-making and explores strategies for eliminating or streamlining approval processes, fostering a more responsive and agile revenue administration.

3.2.2.15. Legacy Systems Compatibility:

Laws that mandate the use of legacy systems or hinder the integration of modern technologies pose significant challenges to the digitalization agenda. This section underscores the importance of reviewing and eliminating legislation that inhibits the compatibility of revenue systems with state-of-the-art technologies, ensuring a seamless transition to a digitally empowered revenue framework.

By examining these considerations, revenue authorities can navigate the complex task of eliminating outdated legislation, paving the way for a streamlined and effective digitalization process that aligns with the demands of the modern era. By focusing on these specific laws, revenue authorities can strategically eliminate barriers that hinder the full potential of digitalization.

CHAPTER 4: NEW AND UPDATED LAWS

Updating laws is essential for revenue authorities undergoing digital transformation to ensure the effective and secure handling of taxpayer information. The transition to digital systems brings about significant changes in how tax information is collected, processed, and stored. By addressing technological challenges, enhancing data protection measures, and promoting compliance with international standards, updated laws play a crucial role in building trust, facilitating cross-border cooperation, and promoting innovation in tax administration.

4.1. Necessity For Legislative Overhaul

4.1.1. Technology's Impact on Taxation

Advancements in technology have reshaped business models and financial transactions. force vis a vis the technology in place and technology to be installed. The technology in use can have a direct impact on the efficiency of services provided by the tax administration and ultimately on the revenue collected. The elimination of manual tax filing increases exponentially the number of submissions and reduces compliance costs, while improving the relationship between the Tax Administration and the taxpayer, who can comply from the comfort of their home.   Another example is before the advent of the internet, tax registration, collection, data processing and audits were much more location specific and information sharing was more cumbersome. The interconnection between tax offices and portal document submissions have allowed taxpayers to comply from different locations within the same jurisdiction and even cross-border audits through exchange of information mechanisms between jurisdictions.

As such, most tax systems' technology used in 2000 can generally be considered obsolete in 2024 and it is not realistic to expect governments and their regulatory frameworks to be changed at the same rate. However, there must at least be a strategy for periodic reviews of the laws in Integrated databases that connect different government agencies such as immigration services, tax authority and employee portals, for example, may optimize taxpayer registration, audits and risk reduction. Tax Administrations meet the challenge of the urgent need for legislation to reflect these changes in the tax landscape.

4.1.2. Enhancing Compliance and Efficiency

Enacting and updating legislation is an essential element which contributes to improved compliance mechanisms and the overall efficiency of tax authorities, ensuring they keep pace with the rapidly evolving digital environment.

In the pursuit of digitalizing tax authorities, the implementation of new laws or the update of existing ones plays a pivotal role in enhancing compliance and efficiency. These legislative measures aim to align taxation frameworks with the dynamic landscape of digital transactions

and business models. The introduction of real-time reporting requirements ensures that tax authorities have access to accurate and up-to-date financial information, promoting transparency and minimizing the risk of tax evasion. Furthermore, the adaptation of digital taxation policies addresses cross-border transactions, virtual business establishments, and the taxation of digital services, fostering a fair and equitable tax framework. By incorporating these legal advancements, tax authorities can streamline processes, encourage taxpayer compliance, and leverage technology to create a more efficient and responsive tax administration system in the digital age.

4.1.3. Digital Taxation Policies:

In a pursuit to address the recent technological developments which have changed business operations, allowing for commercial activities and service provision to be fully remote or with little to no physical presence, Tax Administrations have considered new policy solutions beyond the traditional and many have or are considering the introduction of laws such as taxes on digital services, taxing electronic transactions or industry-specific policies for telecommunications and computing/software, VAT on e-commerce, etc. Tax Administrations, therefore, aim to introduce comprehensive policies that specifically address the taxation of digital services, cross-border transactions, and virtual business establishments.

The introduction of new taxes or the broadening of the scope of a tax code is in most cases a grave political decision and its considerations go beyond revenue collection objectives. However in the current business environment, these policies can help in creating a fair and equitable tax framework for businesses operating in the digital space and protection of the tax base of source state jurisdictions.

Inadequate laws may result in procedural or technological duplication and redundancies, weak standardization of payment portals or methods, or limited transparency and accountability. Inadequate tax laws may also expose public servants and IT specialists to legal liability, especially if they unwittingly implement payment programmes that contravene existing laws and regulations.[6]

4.1.4. Real-time Reporting Requirements:

Real-time reporting of e-invoicing information refers to the instantaneous transmission and availability of electronic invoice data to relevant stakeholders. It involves the continuous and immediate exchange of invoice details between businesses, tax authorities and other authorized

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[6]https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/17783/ICTD_WP152.pdf?sequence=1&isAllowed=y

entities.[7] E-invoicing is the electronic generation, transmission, and receipt of invoices in a structured digital format. Real-time reporting enhances the traditional e-invoicing process by enabling instant visibility and access to invoice information as soon as it is generated or updated. This approach allows tax authorities and other relevant parties to monitor and verify invoice transactions in real-time, improving tax compliance, reducing fraud, and streamlining administrative processes.

It is crucial to implement laws mandating, defining and regulating real-time reporting of financial transactions for tax compliance, which ensures that tax authorities have access to accurate and up-to-date information, reducing the risk of tax evasion and allowing for more proactive enforcement.

4.1.5. Remote payment systems (cardholder not present - CNP) transactions:

Digital transformation inevitably leads (or should least) to the elimination of cash payments, and a shift to payments solutions completely within the banking umbrella, and more especially and for more efficiency, to digital payments. Digital payments relieve governments of many burdens associated with cash, and thus reduce administrative costs and reduce risk. This includes the manual processes involved in collecting, counting, recording, and transporting cash. Digital payments include automated clearing house transfers directly between financial accounts, payments made by credit and debit cards, wire transactions, mobile money transactions, and other non-cash payments.[8]

Effective digital P2G payment systems are inevitably dependent on appropriate legal and regulatory frameworks. These frameworks are often necessary to permit administrative reforms, including the simplification of tax procedures to enable digital payments. Adequate and context-specific laws and regulations clarify the rules, standards, and procedures governing the various technical or institutional functions of the payment systems. These functions could include the use of digital signatures and data encryption, as well as consumer protection and data privacy. [9]

4.1.6. Data Protection and Privacy Legislation:

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[7] https://dddinvoices.com/learn/what-is-an-e-invoice/

[8] file:///C:/Users/erita/Downloads/9781484315224-ch013.pdf

[9]
https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/17783/ICTD_WP152.pdf?sequence=1&isAllowed=y

Enough cannot be said about the importance of data protection and privacy laws in the digital era. Tax Authorities should strive to strengthen laws related to data protection and privacy, especially considering the increased reliance on digital data. This helps in building trust among taxpayers by ensuring that sensitive information is handled securely and in compliance with international standards. This Guide expounds on this topic in Part 3 on the Data Governance Framework.

4.1.7. Collaboration with Stakeholders and Technology Providers:

Legal reform for digitalization also includes laws or regulations clarifying the roles of various stakeholders, including the tax administration itself, payment service providers and vendors, ministries of finance, and the central bank, among others. These also facilitate cross-border collaboration between tax authorities. The legal framework is to be reviewed with a goal to encourage the integration of advanced technologies such as artificial intelligence and blockchain, which can enhance the efficiency of tax administration processes.

4.1.8. Adaptability and Flexibility:

Laws should be drafted with adaptability and flexibility in mind. The legal framework for digital transformation in any field should be capable of accommodating future technological developments and changes in business practices, ensuring that the legislation remains relevant over time, thus a degree of flexibility and adaptability are essential. The new laws therefore should be future proof.

4.1.9. Catering for Emerging Technologies

Digitalization often involves the adoption of new technologies such as cloud computing, big data analytics, and artificial intelligence. Laws need to be updated to regulate the use of these technologies in handling taxpayer information effectively and securely. The legal framework within a jurisdiction should accommodate the use of emerging technologies such as artificial intelligence and machine learning algorithms in tax assessments, ensuring a balance between automation and human oversight. In this process of legal review, legislation is revised to make legal considerations for the use of these technologies as well as other like blockchain in ensuring the integrity of tax records and facilitating secure and transparent transactions.

4.1.10. Continuous Monitoring and Feedback Mechanisms:

It is important to establish mechanisms for continuous monitoring and feedback. This allows tax administrations to identify any challenges or loopholes in the legislation promptly, enabling timely adjustments and improvements. By addressing these aspects through legislation, tax administrations can create a supportive legal framework that not only improves compliance but also enhances the overall efficiency of tax administration processes in the digital age.

4.2. Key Components of New Laws

In an ideal scenario of digitalization of Tax Administrations, legal frameworks create the playing field for tax administration processes to happen in a fluid and effect manner and protect taxpayer's rights and create the appropriate circumstances for taxpayer obligations to be performed, all within the technological platforms that are up to date with the digital economy. As such, this ideal scenario can be seen with the following characteristics[10]:

- tax rule design and drafting increasingly becomes a co-creative effort between policy and administrative experts and governmental and private stakeholders;
- a shift from mere translation of tax rules from paper into system designs, to incorporation of "rules as code" with transparency and testing
framework in place; and
- migrating from centralized execution of tax rules within the tax administration to a more decentralized network of 'tax agents' in that the tax
administration provides the technical rules and information needed for elements of tax processing to take place within taxpayers' natural systems.

In this ideal scenario it can be said that "*Tax law is increasingly being designed via a rules-as-code principle, allowing for direct importation into taxpayers' natural systems. There is a transparency and testing framework in place, supported by AI. Assurance that taxpayers' systems have implemented tax law correctly is increasingly done through remote processes involving AI, as is the identification and resolution of remaining areas of tax uncertainty.*"[11]

Some areas of possible innovation are:
 a. Digital taxpayer registration and management systems (use of forms and e-forms)
 b. Legal framework for inter-institutional database sharing (e.g., Immigration services and Tax Administration)
 c. Legal framework for database management systems
 d. Legal requirements for digital signatures
 e. New technology handling
 f. Guidance on handling and taxation of Big data

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[10] https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/digital-transformation-maturity-model.pdf - page 27

[11] https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/digital-transformation-maturity-model.pdf - page 28

g. Technology for compliance
h. Guidance on handling and taxation of Cloud computing

The building blocks of this new laws can be said to include:

4.2.1. Confidentiality

Confidentiality of taxpayers' information is a cornerstone of modern taxation systems. It ensures trust between taxpayers and tax authorities, encourages compliance, and upholds fundamental rights to privacy. Therefore, when drafting new tax laws, policymakers must prioritize mechanisms to safeguard taxpayer confidentiality effectively.

Taxpayer confidentiality serves various critical purposes in a taxation system:

a. ***Privacy Protection***: Taxpayers have a legitimate expectation of privacy regarding their financial affairs. Confidentiality shields them from unwarranted scrutiny and prevents unauthorized access to sensitive information.

b. ***Compliance and Trust***: Maintaining confidentiality fosters trust between taxpayers and tax authorities. When individuals believe their information is secure, they are more likely to comply willingly with tax obligations, reducing the likelihood of tax evasion and fraud.

c. ***Legal and Ethical Obligations***: Many jurisdictions have laws and regulations mandating the protection of taxpayer information. Upholding these legal and ethical obligations is essential to maintain the integrity of the taxation system and respect individual rights.

Despite its importance, taxpayer confidentiality faces several challenges:

a. ***Technological Advancements:*** The digitalization of tax systems has increased the volume and complexity of taxpayer data. Cybersecurity threats, such as hacking and data breaches, pose significant risks to confidentiality.

b. ***Cross-border Transactions***: In an interconnected global economy, taxpayers engage in cross-border transactions, making it challenging to enforce confidentiality across jurisdictions with varying legal frameworks and enforcement mechanisms.

c. ***Data Sharing Initiatives***: Governments may implement data sharing initiatives among agencies for purposes such as combating financial crimes. While these initiatives aim to enhance compliance and enforcement, they also raise concerns about maintaining confidentiality and preventing misuse of taxpayer information.

To address some of these challenges, the following strategies may be adopted.

a.   ***Clear Legal Frameworks:*** New tax laws should include clear provisions outlining the obligations of tax authorities regarding the confidentiality of taxpayer information. These provisions should be aligned with existing privacy laws and international standards.

b.   ***Robust Data Protection Measures***: Incorporating robust data protection measures, such as encryption, access controls, and regular audits, can help mitigate cybersecurity risks and prevent unauthorized access to taxpayer data. Laws should establish robust provisions for the protection of taxpayer data, outlining strict requirements for its collection, storage, processing, and sharing. This includes measures to safeguard against unauthorized access, breaches, and misuse, as well as protocols for notifying affected individuals in the event of a data breach. Compliance with relevant data protection and privacy regulations should be emphasized.

c.   ***Cross-border Cooperation***: Enhancing cooperation and information exchange mechanisms between tax authorities across borders can facilitate the enforcement of confidentiality standards in an increasingly globalized tax environment.

d.   ***Public Awareness and Education***: Educating taxpayers about their rights regarding confidentiality and the measures in place to protect their information can promote trust and compliance while also empowering individuals to safeguard their data.

e.   ***Independent Oversight Mechanisms***: Establishing independent oversight bodies tasked with monitoring compliance with confidentiality requirements and investigating breaches can enhance accountability and reinforce public trust in the taxation system.

4.2.2. Cybersecurity

Given the increasing prevalence of cyber threats, laws should address cybersecurity concerns by mandating the implementation of comprehensive cybersecurity measures. This includes requirements for regular risk assessments, security audits, encryption of sensitive data, and the establishment of incident response plans to mitigate and address cyber-attacks effectively.

4.2.3. Electronic Transactions and Signatures

New laws should recognize the validity and enforceability of electronic transactions and signatures in tax-related processes. This involves establishing legal frameworks for the electronic filing of tax returns, the issuance of electronic invoices, and the authentication of taxpayer identities through digital means, such as digital signatures or biometric authentication.

4.2.4. Digital Recordkeeping

To accommodate the transition from paper-based to electronic recordkeeping systems, laws should outline requirements for the creation, maintenance, and retention of digital records. This includes specifying the formats, standards, and storage methods for electronic records, as well as the duration for which records must be retained to comply with tax regulations.

4.2.5. Interoperability and Integration

Laws should promote interoperability and integration among different digital systems used by revenue authorities, as well as with external stakeholders such as taxpayers, financial institutions, and other government agencies. This involves establishing standards for data exchange, APIs (Application Programming Interfaces) for system integration, and mechanisms for sharing taxpayer information securely and efficiently.

4.2.6. Taxpayer Rights and Obligations

New laws should reaffirm taxpayer rights and obligations in the context of digital tax administration, ensuring transparency, fairness, and accountability in the treatment of taxpayers. This includes provisions for informing taxpayers about their rights and responsibilities, providing access to digital tax services and resources, and offering avenues for recourse in case of disputes or grievances.

4.2.7. Compliance Monitoring and Enforcement

To maintain the integrity of the tax system, laws should empower revenue authorities with enhanced tools and capabilities for monitoring compliance and enforcing tax laws in the digital environment. This may include leveraging data analytics, machine learning, and other advanced technologies to detect non-compliance, identify tax evasion schemes, and initiate enforcement actions effectively.

4.2.8. Capacity Building and Training

Recognizing the importance of human resources in digital transformation, laws should allocate resources and mandate training programs to equip tax officials with the necessary skills and knowledge to adapt to new digital tools and processes effectively. This includes training on cybersecurity best practices, data privacy regulations, and the use of digital tax administration platforms. This training should also be extended to taxpayers and other stakeholders to allow for buy-in.

By incorporating these key components into new laws, revenue authorities can effectively navigate the challenges and opportunities presented by digitalization, ensuring the seamless

transition to modern, technology-driven tax administration processes while upholding taxpayer rights and maintaining compliance with regulatory standards.

ANNEX 3 – PART 4

PART 4 – USE OF INNOVATIVE TECHNOLOGIES

Part 4 delivers a comprehensive overview of technologies and techniques actively shaping the tax landscape, both in current practice and with regard to future transformations. The chapter serves as a guide, shedding light on the mechanisms that contribute to enhancing the efficiency of tax administrations. It provides readers with explanations of key terminologies and also ventures into the expansive area of application possibilities, offering an understanding of how these technologies can be used in practice.

A useful feature of this chapter lies in the utilization of the Institute for Digitization in Tax Law (IDSt) maturity level as an evaluative framework. Within the IDSt the Committee for "Innovative Technologies in Taxation", consisting of experts in this field (from tax authorities, companies, academia and tax consultants), has made an assessment based on its extensive practical experience.

This framework becomes a lens through which readers can assess the developmental progress of these technologies, particularly concerning their applicability within the tax environment. By employing the IDSt maturity level, a detailed examination of the technological evolution is provided, guiding readers through the current state of these advancements. Furthermore, the concept of relevance within the context of the IDSt framework enriches the compendium. This dual perspective enables readers to comprehend not only the immediate impact of these technologies but also the enduring role they are poised to play in shaping the landscape of tax-related activities.

Chapter 7 goes beyond mere definitions by showcasing specific tax use cases under the "concrete use" section. These real-world or potential future examples illustrate how these technologies seamlessly integrate into the tax environment, bringing about tangible improvements. Through the illustrative use cases, the transformative potential of these technologies is illuminated, and it becomes evident that the chapter is a dynamic exploration of the evolving landscape where technology and taxation converge. In navigating through this chapter, readers are not only equipped with knowledge but are also empowered to envision the future contours of tax functions, shaped by technological progress.

CHAPTER 7 – INNOVATIVE TECHNOLOGIES

7.1.   Introduction

Innovative technologies can help tax administrations in several ways. Here are some examples:

Automation: Artificial Intelligence (AI) and Robotics Process Automation (RPA) can help tax administrations to automate a wide range of tasks, including data entry, document processing, and even decision-making. For example, AI-powered chatbots can help to give taxpayers answers to common questions, while RPA can automatically generate tax assessment notices and other documents. Automation can help reduce the workload on tax administrators and improve the speed and accuracy of tax-related tasks.

Data Analytics: (Big) Data Analytics, especially Business Intelligence (BI), can help tax administrations to identify non-compliant taxpayers and take appropriate action. For example, tax authorities can use predictive analytics to identify taxpayers who are at high risk of non-compliance and target them for audit. Data Analytics can also be used to identify trends and patterns in taxpayer behaviour, which can help tax authorities to develop more effective compliance strategies.

Distributed Ledger: Blockchain technology as one specific type of Distributed Ledger, can help tax authorities to create a more secure tax system. For example, blockchain can be used to create a tamper-proof record of tax-related transactions, which can help prevent fraud and improve compliance (e.g. VAT and TP). Blockchain can also be used to enable more efficient sharing of tax-related data between different tax authorities, improving collaboration and reducing the risk of data loss or corruption.

Cloud computing: Cloud-based systems can help tax authorities to access and share data more easily and securely. Cloud-based systems can be designed to be scalable, flexible, and cost-effective, enabling tax authorities to manage their data and applications more efficiently. Cloud-based systems can also provide tax authorities with real-time access to data, enabling them to make more informed decisions.

Electronic filing and payment: Electronic filing and payment systems can provide taxpayers with a more convenient and efficient way to file their tax returns and pay their taxes. These systems can be designed to be user-friendly and secure and can provide taxpayers with real-time feedback on the status of their filings and payments. Electronic systems can also help tax authorities to reduce the cost and complexity of tax administration.

The latter example shows that the use of innovative technologies by tax administrations can be beneficial for tax authorities themselves but also for taxpayers. It can improve taxpayer experience and reduce the administrative burden on taxpayers. Other examples are AI-powered chatbots as mentioned in the first example: they are useful for tax authorities as they relieve the staff from burdensome and time-consuming work. At the same time they can provide taxpayers with instant answers to their tax-related questions. Overall, the aim of applying innovative technologies should be to help tax administrations to improve efficiency, accuracy, and compliance and equally to enhance the taxpayer experience.

7.2.   Artificial Intelligence (AI)

> **Maturity for tax use: 70%**
> **Relevance for tax use: 90%**

The use of artificial intelligence (AI) as a branch of computer science is gaining significance in the intricate domain of taxation, signalling the inception of a transformative era. The multifaceted landscape of AI encompasses not only rule-based IT systems but also delves into the realms of machine learning systems and cutting-edge deep learning technologies. At its core, AI encapsulates the capacity of an IT system to emulate intelligent and human-like behaviours. In this context, the control area is virtually predestined for the use of AI. In many cases, a good and representative database can be used ("Big Tax Data").

In addition, there are a large number of repetitive activities that lend themselves to AI-supported automation. Finally the use of generative AI (here: Natural Language Processing – NLP) can help tremendously in searching and analysing existing text as well as generating new text. The evolutionary trajectory of AI in taxation is poised to revolutionize traditional paradigms. As AI algorithms continuously refine their capabilities through iterative learning processes, the tax landscape stands to benefit from increasingly sophisticated and precise decision-making. The synergy between tax professionals and AI technologies becomes a symbiotic partnership, leveraging the strengths of each to create a comprehensive and adaptive approach to tax management.

From a tax administrations perspective, the use of AI in the field of taxation is a development that is gaining importance. AI, defined as the ability of an IT system to exhibit intelligent, human-like behaviour, can be utilized in various forms, such as rule-based systems, machine learning systems, and deep learning technologies. The control area in taxation is particularly suited for the use of AI. By leveraging large databases, referred to as "Big Tax Data," AI systems can analyse vast amounts of information and identify patterns, anomalies, and potential

tax issues more efficiently than manual processes. This enables tax authorities to make better-informed decisions and allocate their resources more effectively.

One of the main advantages of using AI in taxation is the ability to process vast amounts of data quickly and accurately. This can lead to increased efficiency and improved compliance with tax regulations by identifying errors or potential issues that may have been overlooked in traditional methods. Additionally, AI-supported automation can free up resources for more complex tasks that require human decision-making. AI can be particularly valuable in automating repetitive tasks in taxation. Many tax-related activities involve following established rules and procedures, which can be performed by AI systems without human intervention. This includes tasks such as data entry, document processing, and basic compliance checks. By automating these routine activities, AI can free up human resources to focus on more complex and value-added tasks, such as tax planning and analysis.

Furthermore, AI-powered systems can improve the accuracy and consistency of tax assessments. Machine learning algorithms can be trained on historical tax data to identify patterns and predict potential tax risks or areas of non-compliance. By leveraging these insights, tax authorities can enhance their audit processes and target their resources more effectively. However, it is important to note that the development of AI in taxation is still in its early stages. Challenges related to data quality, privacy, and interpretability of AI models need to be addressed. Ethical considerations, fairness, and transparency are also crucial when implementing AI systems in tax-related decision-making.

It is therefore also important to note that AI should not replace human tax experts entirely. While AI can process data at a greater scale and speed, it may lack the analytical skills and ability to interpret information in the context of unique situations. Therefore, the integration of AI into taxation should be seen as a complementary tool rather than a replacement for human expertise. Overall, as AI technologies continue to advance and organizations accumulate more tax-related data, the use of AI in taxation is likely to grow, enabling more efficient and effective tax administration.

7.2.1. Generic fields of application:
a. Repetitive activities
b. Research activities or knowledge acquisition activities
c. Data / document analyses

7.2.2. Concrete use cases:
a. Repetitive activities:

- Assistance systems, e.g. for the treatment of series transactions, withholding tax deduction or incentives
- Support in tax determination in the area of VAT
- Assistance in the determination of tariff proposals in the customs area
- Automatic accounting machines or accounting detectors for the validation of accounting records.
- Recognition and analysis of tax assessments, such as in the area of business tax or real estate tax

b. Research activities or knowledge acquisition activities
- Finding the appropriate case law, administrative instruction or literature opinion based on the context by means of an artificially created understanding of the search query.
- Intelligent briefs with alert function, which indicate the need for tax action (=> NLP – Natural Language Processing)
- Contract analyses

c. Data analysis
- Use of machine learning to enrich or combine with BI solutions (=> BI – Business Intelligence) and Tax CMS instances
- Continuous auditing via predefined pattern recognition in the area of sales tax or payroll tax
- Detection of violations of transfer pricing guidelines or compliance with the interest barrier

7.3.   Natural Language Processing - NLP

> *Maturity for tax use: 40%*
> *Relevance for tax use: 90%*

Natural Language Processing ("NLP") is a subfield of "Artificial Intelligence" and stands for techniques and methods for the machine processing of natural language, especially in the form of text. In simple terms, NLP is a methodology that interprets texts based on algorithms and classifies them in the correct context. This should enable tax administrations to find the appropriate case law, administrative opinion or commentary literature for any tax issue without human intervention. It is precisely against this background that NLP is gaining in importance for the targeted support of research activities, also in the area of taxation.

As a subfield of Artificial Intelligence (AI), NLP focuses on the interaction between computers and human language. In the context of taxation, NLP can be a valuable tool for researchers and professionals. Here are a few ways NLP can support research activities in the field of taxation:

- Document Analysis: NLP techniques can be used to analyse vast amounts of tax-related documents, such as case law, administrative opinions, and commentary literature. By automatically extracting relevant information from these texts, researchers can quickly identify key insights and precedents.

- Information Retrieval: NLP can enhance the search capabilities for tax-related information. By using algorithms to understand the context and intent of a query, NLP systems can retrieve relevant documents, cases, or opinions that match the user's needs more effectively.

- Sentiment Analysis: NLP can analyse the sentiment or emotional tone expressed in tax-related texts. This analysis can help identify public opinion, attitudes towards specific tax policies, or reactions to legislative changes.

- Automated Summarization: NLP algorithms can automatically generate summaries of lengthy tax documents. This can save researchers significant time by providing concise overviews and key points from complex texts.

- Taxonomy and Categorization: NLP techniques can assist in organizing tax-related information into meaningful categories or taxonomies. By automatically classifying documents based on their content, NLP systems can help researchers navigate through large datasets and identify relevant materials.

While NLP can provide valuable support in tax research, it's important to note that, just like AI, it is not a replacement for human expertise. The interpretation and analysis of tax laws often require a deep understanding of legal and regulatory frameworks, which currently exceeds the capabilities of NLP systems alone. However, NLP can augment human efforts by accelerating information retrieval and analysis processes, enabling researchers to make more informed decisions efficiently.

7.3.1. Generic fields of application:

a. Interpretation of unstructured data
b. Classification of text and language in the professional context
c. Finding literature on the same topic

d. Knowledge management within an organization

7.3.2. Concrete use cases:

a. Finding the appropriate case law, administrative instruction or literature opinion based on the professional context.
b. Use of the specific tax knowledge available in an organization, created and available in documents of different formats.
c. Possibility to issue automatic notices when legislation or case law changes in relation to a tax issue (Intelligent "Alert" function)
d. Analysis of tax notices (possibly in combination with => OCR – Optical Character Recognition)
e. Analysis of contracts (if necessary, in combination with => OCR – Optical Character Recognition)

7.4. Blockchain

> **Maturity for tax use: 80%**
> **Relevance for tax use: 90%**

The blockchain functions as a decentralized database that is mirrored in the network on a large number of computers. Each entry in the blockchain is represented by an (information) block. Each block entry in turn represents a "life issue" or transaction. The blocks are cryptographically linked in such a way that it is fundamentally impossible for data to be subsequently changed, which is why it is also referred to as a kind of "digital notary". Numerous use cases also arise in the area of taxation - particularly in the context of transaction-intensive types of tax. For this purpose, blockchain technology offers the ideal conditions for the use of so-called smart contracts (self-executing contracts), which can be used for tax purposes along the entire transaction chain of a blockchain.

There is a very potential for blockchain technology in the field of taxation, because Blockchain functions as a decentralized and immutable database that maintains a transparent record of transactions across a network of computers. Each transaction or life issue is represented by a block, and these blocks are cryptographically linked, ensuring that the data stored on the blockchain cannot be easily altered or tampered with.

The inherent characteristics of blockchain make it a promising tool for various taxation use cases, particularly in transaction-intensive tax areas. Here are a few examples:

a. ***Transparent and Traceable Transactions***: Blockchain can provide a transparent and auditable record of transactions, enabling tax authorities to verify the accuracy of reported transactions. This can help reduce tax fraud and evasion.

b. ***Smart Contracts for Tax Automation***: Smart contracts are self-executing agreements written in code that automatically execute predefined actions when specified conditions are met. In the context of taxation, smart contracts can be used to automate tax calculations, payments, and compliance. For instance, VAT or sales tax can be automatically calculated and transferred to the relevant tax authorities when a transaction occurs on the blockchain.

c. ***Enhanced Tax Compliance***: Blockchain's immutability and transparency can facilitate enhanced tax compliance. By recording transactions on a blockchain, tax authorities can have real-time visibility into economic activities, simplifying the process of verifying income, expenses, and tax liabilities.

d. ***Supply Chain and Customs Duties***: Blockchain can be utilized to track and verify the origin and movement of goods in supply chains. This can aid in ensuring compliance with customs duties and excise taxes, reducing smuggling and illicit trade.

e. ***Tokenization of Assets***: Blockchain enables the tokenization of assets, representing them as digital tokens on the blockchain. This can have implications for tax purposes, such as capital gains tax on the sale or transfer of digital assets.

However, it's important to note that while blockchain has significant potential, there are also challenges to consider. These include scalability, privacy concerns, regulatory frameworks, interoperability, and the integration of blockchain with existing tax systems. As the technology continues to evolve and regulatory frameworks adapt, we can expect to see further exploration and implementation of blockchain in taxation, leveraging its benefits for transparency, efficiency, and automation.

7.4.1. Generic fields of application:

a. Digital infrastructure between companies and with the public administration for the digital storage and exchange of tax data
b. Universal (tax) identity
c. Fraud identification to secure the tax revenue
d. Unalterable ("forgery-proof") documentation
e. Securing and verification of original tax documents

7.4.2. Concrete use cases:

a. Value added tax:

- Documentary evidence for tax exemption of intra-Community supplies (also in the case of series transactions).
- Documentation of deliveries to / from a consignment warehouse.
- VAT / input tax mapping, validation of VAT ID numbers.

b. Customs

- Long-term supplier declaration, proof of delivery, documentation of flow of goods.

c. Transfer pricing:

- Transfer pricing documentation, documentation of intercompany transactions.
- Mapping of transfer prices via smart contracts (self-executing contracts).

d. Capital gains tax:

- Avoidance of double refund by the tax authorities.

e. Withholding tax:

- Documentation of withholding tax.

## 7.5.	Robotics Process Automation – RPA

> **Maturity for tax use: 90%**
> **Relevance for tax use: 70%**

Robotic Process Automation, or "RPA" for short, describes the automated processing of structured repetitive activities by "software robots". The use of RPA ultimately enables the automated processing of standard procedures. Bots independently access systems or data and independently perform selected transactions. In doing so, the bots act in a manner comparable to humans (one could also say that humans are imitated) by automating user input and using existing user interfaces in the form of keyboard or mouse input. Accordingly, this technology lends itself to taking over repetitive manual tasks ("click work") in the control area, especially when data needs to be transferred between different systems.

RPA refers to the use of software robots or bots to automate repetitive, rule-based tasks that are typically performed by humans. These bots interact with various software systems and applications, mimicking human actions such as data entry, mouse clicks, and keyboard inputs.

RPA technology allows organizations to streamline their business processes, reduce human error, improve efficiency, and free up employees' time for more value-added work.

RPA bots can access systems, retrieve and manipulate data, perform calculations, and execute predefined tasks. They can work across multiple systems, bridging the gap between different applications and databases, and facilitate the transfer of information between them. By automating these routine tasks, RPA helps organizations improve accuracy, speed, and consistency while reducing costs and increasing productivity.

RPA is often employed in areas where there are repetitive and rule-based tasks, such as data entry, data validation, report generation, invoice processing, customer onboarding, and more. It can be particularly beneficial when there is a need for data exchange between different systems that do not have direct integration capabilities.

Overall, RPA is a technology that enables organizations to automate manual and repetitive tasks, allowing employees to focus on more strategic and complex activities.

7.5.1. Generic fields of application:
- Taking over repetitive tasks.
- Processing of standard procedures.
- Filling out forms.
- Evaluation of data.

7.5.2. Concrete use cases:
- Preparation of the advance VAT return and the Intrastat return.
- Compilation of payroll data (aggregation of information from different systems such as human resources, time recording, etc.)
- Invoice verification (especially in combination with => OCR – Optical Character Recognition).
- Reading out information from tax assessment notices (if necessary, in combination with => OCR – Optical Character Recognition).
- Checking travel expenses.
- Initiating bookings (if necessary, in combination with => AI – Artificial Intelligence).
- Data preparation for subsequent analysis tools or BI solutions (=> BI – Business Intelligence).
- Tax reporting support, especially (pre-)aggregation of information.

7.6.   Chatbot

Maturity for tax use: 80%
Relevance for tax use: 70%

A chatbot is a technical dialog system that enables dialog between humans and machines. The "conversation" takes place via text input or natural language (also "voicebot"). The user can ask questions, which the bot answers accordingly. Technically, a distinction can be made between two types: Rule-based or AI-based. While chatbots with artificial intelligence learn from existing dialogs, rule-based chatbots draw on a catalogue of predefined questions and answers. For the tax sector, numerous possible applications are opening up, particularly in the form of "digital assistance systems".

In terms of technical classification, there are primarily two types of chatbots: rule-based and AI-based. Rule-based chatbots rely on predefined sets of rules, questions, and corresponding answers. These chatbots follow specific decision trees or logic flows to generate responses.

On the other hand, AI-based chatbots leverage artificial intelligence techniques, such as machine learning and natural language processing (NLP). These chatbots learn from existing conversations or data and can generate responses based on patterns and contextual understanding. They can adapt and improve their performance over time through continuous learning.

In the tax sector, there are numerous potential applications for chatbots, particularly in the form of digital assistance systems. These chatbots can assist users with tax-related inquiries, provide information on tax regulations, help with tax calculations, or guide users through tax filing processes. By automating certain tasks and providing accurate information, chatbots can enhance efficiency and convenience in the tax domain.

7.7.3.   Generic fields of application:
a. Answering recurring (standard) questions.
b. Structuring queries and Avoiding errors.

7.7.4.   Concrete use cases:
a. Digital assistance systems for sales tax or payroll tax issues, by way of example:
   - Invoicing obligations in different member states.
   - Series transactions/triangular transactions for VAT purposes.
   - Treatment of incentives.

- Taxation of e-mobility.
- Capitalization/depreciation of software.

b. Support for tax determination (if necessary, in combination with => AI – Artificial Intelligence & => NLP – Natural Language Processing)

c. Structuring of tax-related queries by automated assignment of queries to specific topics / employee groups etc.

d. Support in the operation of tax applications (integration in the respective interface) e.g. help with errors (if necessary, in combination with => RPA – Robotics Process Automation).

7.7. Process Mining

Maturity for tax use: 90%
Relevance for tax use: 100%

Process Mining stands for software solutions that are used to analyze and visualize existing data flows within an organization's processes. Based on these existing data flows, processes can be traced ("digital walkthrough") and anomalies can be identified. By tracing these processes digitally, process mining can help identify anomalies and deviations from predefined target process flows or "happy paths" and thus improve the actual situation in a targeted manner. Process mining is also seen as a connecting technology between data mining and process management. Especially in view of the increasing complexity of tax-relevant processes, process mining is becoming more and more important in the tax area.

It provides valuable insights into how processes are actually being executed, allowing organizations to compare the observed processes with the ideal or desired ones. This comparison helps identify areas for improvement and optimization in order to bring the actual situation closer to the target process flows. By pinpointing inefficiencies, bottlenecks, or compliance issues, process mining enables organizations to make data-driven decisions and take targeted actions to enhance their processes.

In the tax area, where processes can be complex and subject to strict regulations, process mining plays an increasingly important role. It allows tax professionals to gain a deeper understanding of tax-relevant processes, detect potential compliance issues, and identify opportunities for streamlining and automation. By applying process mining techniques, tax professionals can optimize tax processes, ensure compliance with tax regulations, and improve overall efficiency.

Process mining can be considered a connecting technology between data mining and process management. It leverages the wealth of data available within an organization and applies data mining techniques to extract valuable insights about process execution. These insights can then be used to enhance business process management strategies, align processes with business goals, and drive continuous improvement.

Overall, process mining offers a powerful set of tools and techniques for analysing, visualizing, and improving business processes, including those in the tax domain. Its ability to provide a comprehensive view of process execution based on real data makes it an increasingly important technology for organizations aiming to optimize their operations and achieve better outcomes.

7.7.1. Generic fields of application:

a. Virtual process walkthrough.
b. Uncovering of process deficits and improvement potential.
c. Identification of target/actual deviations in control-relevant processes.
d. Modelling and definition of executable business processes.

7.7.2. Concrete use cases:

a. VAT / Sales tax:
- Validation of the overall tax document flow, including tax determination.
- Validation of the accounting system.
- Preparation of real-time / near real-time reporting requirements.

b. Tax CMS:
- Validation of target processes incl. specified controls.
- Recognition of errors / inefficient processes.

c. Tax processes in general:
- Increasing the efficiency of tax processes.
- Evaluation of automation potentials in processes and analysis.

7.8.   Cloud Computing

> **Maturity for tax use: 100%**
> **Relevance for tax use: 100%**

Cloud computing describes a model that provides shared computer resources as a service, for example in the form of servers, data storage or applications, on demand (usually via the Internet and device-independently) in real time and with little effort. The advantage of cloud applications lies primarily in the scalability of storage capacities and computing power, with three basic typologies to be distinguished: Software as a Service (SaaS) allows the user to use a program directly via the Internet and is also becoming increasingly important in the environment of tax solutions. With Platform as a Service (PaaS), the service provider provides fully managed environments, for example in the form of portal solutions. Finally, Infrastructure as a Service (IaaS) is a further expansion stage that gives users even more direct access to IT resources.

Cloud computing can be effectively used in tax administration. The various models of cloud computing, such as Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS), offer different levels of flexibility and control for users. SaaS enables users to access tax applications directly through the internet, without the need for local installations. This model is becoming increasingly important in the tax solutions environment, as it allows users to utilize tax software without having to manage the underlying infrastructure.

PaaS provides fully managed environments, including portal solutions, which can be customized to meet the specific needs of tax administration. This allows tax authorities to develop and deploy their own applications and services on a cloud platform, without having to worry about the infrastructure management. IaaS offers users direct access to IT resources, allowing tax administrations to have more control over their computing infrastructure. With IaaS, tax authorities can provision and manage virtual machines, storage, and networks in the cloud, providing scalability and flexibility as needed.

However, as previously mentioned, data security and data privacy are crucial considerations when adopting cloud computing in tax administration. Tax authorities deal with sensitive financial and personal information, and it's important to ensure that this data is properly protected. When implementing cloud solutions, tax administrations should consider the following:

   a. *Data encryption*: Implement strong encryption methods to protect data both in transit and at rest. Encryption helps safeguard sensitive information from unauthorized access.

b. *Access controls*: Implement strict access controls to ensure that only authorized personnel can access tax data. Use multi-factor authentication, role-based access controls, and strong password policies.

c. *Compliance and certifications*: Choose cloud service providers that comply with relevant data protection regulations and have industry-recognized certifications (e.g., ISO 27001). Verify that the provider has adequate security measures in place.

d. *Data segregation*: Ensure that tax data is stored separately from other customers' data to maintain confidentiality and prevent unauthorized access.

e. *Regular audits and monitoring*: Conduct regular security audits and monitoring to identify and address any potential vulnerabilities or security incidents promptly.

f. *Service level agreements (SLAs)*: Establish clear SLAs with the cloud service provider to ensure the availability, performance, and reliability of the tax applications and data.

By implementing appropriate security measures and selecting trustworthy cloud service providers, tax administrations can mitigate the risks associated with data security and data privacy while leveraging the benefits of cloud computing in tax administration.

7.8.1. Generic fields of application:
a. Shared use of applications or IT infrastructure
b. Scalable demand for computing power and storage space
c. Location and device-independent use of computing resources

7.8.2. Concrete use cases:
a. File-share for data exchange between client and consultant
b. Data rooms for data exchange with the tax authorities
c. Collaboration solutions ("client portals") between client and advisor, with the aim of mapping the entire declaration process largely without media discontinuity.
d. Use of web based TaxTech solutions as SaaS solutions
e. Provision of Tax Apps ("smart" solutions for selected tax issues)
f. Use of complete tax engines, primarily in the area of sales tax via the cloud.

7.9. Business Intelligence – BI

> **Maturity for tax use: 100%**
> **Relevance for tax use: 100%**

Business Intelligence refers to the technologies, applications, and practices used to collect, analyse, and present data in a way that provides valuable insights for business decision-making. BI solutions are designed to gather data from various internal and external sources, process it, and transform it into meaningful information that can be used by managers and other stakeholders. The insights gained from this are intended to support managers in particular in making well-founded business decisions. Corresponding software solutions are used to collect data from internal and external sources, analyse it and visualize it using customized reports or so-called key performance indicators ("KPIs") or dashboards. In the tax context, BI solutions are primarily used in the area of mass transactions and thus in the context of sales tax, transfer prices or payroll tax.

In the tax context, BI solutions can be particularly useful in dealing with mass transactions and managing tax-related processes. Here are a few examples of how BI can be applied in the tax field:

a. *Sales Tax*: BI tools can be used to collect transactional data from sales systems and analyse it to identify patterns, trends, and anomalies. This can help in monitoring sales tax compliance, detecting potential errors or fraud, and optimizing tax planning strategies.

b. *Transfer Pricing*: BI solutions can assist in analysing and comparing transaction data between related entities to ensure compliance with transfer pricing regulations. By providing visualizations and reports, BI tools enable tax professionals to monitor intercompany transactions, identify transfer pricing risks, and support transfer pricing documentation requirements.

c. *Payroll Tax*: BI can be employed to consolidate and analyse payroll data, enabling tax professionals to ensure accurate payroll tax calculations and compliance. By integrating data from various HR and payroll systems, BI tools can provide insights into payroll tax expenses, employee benefits, and compliance with tax regulations.

By utilizing BI solutions in the tax context, organizations can streamline their tax processes, identify risks and opportunities, and make informed decisions to optimize their tax positions. These tools enable tax professionals to efficiently analyse large volumes of data, generate

reports, and visualize key performance indicators (KPIs) or dashboards that provide a comprehensive overview of tax-related information.

7.9.1. Generic fields of application:

a. Analysis of mass tax data

b. Detection of anomalies and trends

c. Visualization of data according to pre-defined specifications

d. Independent of ERP or source system

7.9.2. Concrete use cases:

a. VAT / Sales tax:

- Recognition of deviations in incoming and outgoing services
- Recognition of deviations in intra-Community supplies/exports
- Recognition of deviations in intra-Community acquisitions/imports
- Recognition of differences in intra-group series transactions/triangular transactions
- Recognition of differences in the use of master data in tax determination

b. Wage tax:

- Recognizing differences in the use of master data for wage taxation purposes

c. Customs:

- Detection of different tariffing

d. Transfer pricing:

- Detection of violations of transfer pricing guidelines

e. Tax Compliance Management Systems (Tax CMS):

- Detective controls to identify risk cases

f. Performance measurement:

- Presentation of metrics / KPI's of activities for which the tax function is responsible

7.10. ETL – Extract, Transform, Load

> **Maturity for tax use: 90%**
> **Relevance for tax use: 70%**

ETL stands for Extract, Transform and Load. Using appropriate software solutions, data from several, sometimes heterogeneous, structured data sources are combined in a target database, also known as a "data lake" or "data warehouse". ETL aims in particular to keep information at a central location ("single point of information") and to minimize latency times. ETL is thus often also an essential building block for the use of BI solutions or a holistic Tax CMS.

ETL processes are commonly used in various contexts, including tax data management. In the tax domain, ETL plays a crucial role in consolidating and integrating data from diverse sources, such as financial systems, ERP (Enterprise Resource Planning) systems, CRM (Customer Relationship Management) systems, spreadsheets, and other data repositories.

The ETL process involves the following steps:

- Extraction: Data is extracted from multiple sources, which could be structured databases, flat files, or APIs. In the tax context, these sources may include transactional data, financial records, customer information, purchase orders, and more.

- Transformation: Extracted data often requires cleaning, standardization, and enrichment before it can be effectively used for tax purposes. This step involves applying business rules, data validation, data cleansing, data formatting, and performing calculations or aggregations as necessary. Transformations may also involve harmonizing data formats and units of measure to ensure consistency across different source systems.

- Loading: The transformed data is loaded into a target database, which could be a data lake or data warehouse. This central repository acts as a single point of information for tax-related data. The loading process may involve creating data models, defining data schemas, mapping data fields, and structuring the data in a way that facilitates reporting and analysis.

By implementing ETL processes in the tax context, organizations can achieve several benefits:

- Centralization: ETL enables the consolidation of data from various sources into a central repository, promoting a single point of information. This centralization helps ensure data accuracy, consistency, and integrity.

- Data Quality: The transformation phase of ETL allows for data cleansing, validation, and enrichment, improving the quality and reliability of tax-related data. This ensures that tax calculations and reporting are based on accurate and trustworthy information.

- Efficiency: ETL minimizes latency times by automating the extraction, transformation, and loading of data. This reduces manual effort and allows for timely access to up-to-date tax data, which is crucial for compliance, reporting, and decision-making processes.

- Business Intelligence: ETL is often a foundational step for implementing Business Intelligence (BI) solutions in the tax domain. By integrating data from different sources, ETL enables tax professionals to gain insights, perform analysis, and generate meaningful reports for tax planning, risk management, and compliance purposes.

- Tax CMS (Compliance Management System): ETL processes are integral to building a holistic Tax CMS. By extracting and consolidating data from various systems, ETL facilitates the implementation of tax compliance workflows, monitoring tax liabilities, and ensuring adherence to regulatory requirements.

In summary, ETL plays a vital role in the tax context, enabling organizations to combine data from multiple sources, maintain a central repository, and leverage the data for business intelligence, compliance, and tax management purposes.

7.10.1. Generic fields of application:
a. Consolidation of heterogeneous data sources.
b. Central provision of fiscal data for further applications and processes.

7.10.2. Concrete use cases:
a. Establishment of a tax data warehouse or a tax data lake.
b. Creating a harmonized tax data basis.
c. Preparation of data for further tax analysis using data analysis tools, special BI tools (=> BI – Business Intelligence) or process mining applications (=> Process Mining).
d. Preparation of tax reporting.
e. Preparation of data for tax declaration.
f. Tax planning and scenario modelling.

7.11. Optical Character Recognition - OCR

> **Maturity for tax use: 100%**
> **Relevance for tax use: 70%**

OCR describes the use of technology or corresponding software solutions to recognize unstructured information in the form of printed or handwritten text characters. OCR - also known as text recognition - is used to recognize and convert printed or handwritten text characters into machine-readable text. It plays a significant role in various fields, including taxation. In the context of the use of AI or RPA, OCR is also frequently used as a subcomponent to extract or prepare unstructured data for further use.

From a tax perspective, OCR is used in particular in the area of reading tax assessments, at least until assessments are transmitted electronically in structured form in the future. It can be used to extract information from tax assessments, invoices, receipts, and other tax-related documents. By using OCR technology, these documents can be scanned or photographed, and the text within them can be automatically recognized and extracted.

It enables the conversion of unstructured data, such as text within documents, into structured information that can be easily processed and analysed. This structured information can be further utilized by artificial intelligence (AI) or Robotic Process Automation (RPA) systems for various purposes, such as data entry, analysis, or integration with other systems.

While electronic transmission of tax assessments in structured form may become more prevalent in the future, OCR can still be valuable for converting existing paper-based or non-structured documents into machine-readable text. It helps streamline processes, improve accuracy, and reduce manual data entry efforts in tax-related tasks.

Overall, OCR plays a crucial role in digitizing and automating tax processes, enabling more efficient management and analysis of tax-related information.

7.11.1. Generic fields of application:

a. Interpretation of text.
b. Translation of unstructured data into structured data.
c. Data preparation for further solutions in the field of AI or RPA.

7.11.2. Concrete use cases:

a. Readout of invoices or document data.

b. Support of invoice receipt verification by means of the so-called "two-way-match (invoice vs. purchase order) or "Three-Way-Match" (invoice vs. purchase order vs. goods receipt).

c. Automatic assignment of travel expense receipts to travel expense reports.

d. Pre-assignment of receipts (if necessary, in combination with => RPA – Robotics Process Automation).

e. Readout of tax assessments.

7.12. Low Code / No Code

Maturity for tax use: 60%
Relevance for tax use: 90%

Low Code and No Code solutions are software development tools or platforms that allow users to create applications or solutions without the need for traditional programming languages. These solutions utilize a graphical user interface where users can drag and drop function modules to build applications or workflows. The underlying coding is abstracted, and the platform takes care of executing the code in the background. In contrast to No Code solutions, Low Code solutions still require a certain amount of classical programming effort. Low code environments are also primarily used to add missing functions at a later stage. No code solutions also offer employees without programming knowledge the opportunity to create individual solutions, which can be particularly attractive for the tax department.

In a tax context, Low Code and No Code solutions can be beneficial for several reasons. Firstly, they provide a way for individuals without extensive programming knowledge or skills to create custom solutions. This can be particularly useful for the tax department, where employees may have domain expertise but limited coding experience. These solutions allow tax professionals to automate repetitive tasks, streamline processes, and build custom applications specific to their tax-related needs. For example, they could create workflows for tax return preparation, automate data entry and validation, generate reports and analytics, or integrate with other tax-related systems.

Low Code solutions, although requiring some programming effort, offer more flexibility and customization options compared to No Code solutions. They allow for the addition of missing functions, or the integration of complex business logic as required. On the other hand, No Code solutions are typically more user-friendly and accessible, as they require minimal or no coding skills at all. Overall, Low Code and No Code solutions can empower tax professionals to be

more self-sufficient in creating and managing their own software solutions, reducing the reliance on traditional software development cycles and enabling faster innovation and iteration in the tax department.

7.11.3.   Generic fields of application:
a.   Software development without programming knowledge.
b.   Coding in the background.

7.11.4.   Concrete use cases:
a.   Creation of expert tax systems in the form of decision trees, for example in the area of VAT.
b.   Creation of workflows for tax departments to collect recurring information from subsidiaries or from other departments.
c.   Creation of chatbots for recurring tax questions ("Tax Self Service").
d.   Use of predefined building blocks "for digitizing work steps in the tax environment for which standard software is not (yet) available.

In conclusion, the utilization of new technologies presents an opportunity to revolutionize tax administration systems worldwide. Through the integration of the advanced tools discussed here such as artificial intelligence, blockchain, and data analytics, tax authorities can enhance efficiency, accuracy, and compliance while minimizing costs and resource burdens. The adoption of these technologies not only streamlines administrative processes but also fosters transparency, accountability, and trust between taxpayers and government agencies. However, it is imperative for policymakers and tax administrators to address potential challenges such as data privacy concerns, cybersecurity risks, and equitable access to technology. By navigating these obstacles with foresight and collaboration, the potential benefits of modernizing tax administration through new technologies can be fully realized, leading to a more effective and equitable tax system and supporting Domestic Revenue Mobilization efforts.

ANNEX 4 – CASE STUDIES

CASE STUDIES – EXPERIENCE AND LESSONS

There are many varied examples of the introduction and usage of digital tax administration tools by tax administrations. While each country and tax administration has its own unique challenges and circumstances, the experience of others can provide new perspectives and ideas, help avoid pitfalls, solve common challenges, and overall accelerate progress of its digital transformation journey.

This section sets out a small selection of international examples of tax administrations introducing and implementing new technologies. It also considers some lessons their experience can offer other jurisdictions.

1. MEXICO – E-INVOICING

1.1 Background and technology

In 2004, the Mexican SAT (Servicio de Administración Tributaria, or Tax Administration Service) created the legal framework that defined the implementation of the CFDI (Comprobante Fiscal Digital por Internet), its e-invoicing system.

The invoices are verified and certified by a digital signature service provider (PAC). Before using the CFDI method to generate electronic invoices, the organizations must set up a web service connection to an authorized PAC. For the CFDI method, they send an XML message from Finance to the PAC. The PAC validates each invoice, assigns a folio number, and then incorporates the digital stamp that the service tax authorities provide. After the PAC completes the approval process, they receive the approved XML message, and can then submit the invoice to the customer in XML or PDF format.

Over a short span of time, the use of the CFDI has become compulsory in e-accounting throughout Mexico, and hence used in 100% of economic transactions.

1.2 Impact on tax administration and taxpayers

The introduction of Mexico's digital tax administration system (including e-invoicing) has[1]:
- increased the declared tax base by around 150% since 2010.
- directly and indirectly reduced tax evasion and non-compliance, with overall tax revenue and social security contributions increased by about 95% between 2010 to 2016
- Seen total tax evasion fall from 35.7% to 16.1% between 2012 and 2016.

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[1] Better than cash alliance. (October 2020), *Tax Digitalisation in Mexico: Success factors and pathways forward*, Tax Digitalisation in Mexico: Success Factors and Pathways Forward · Better Than Cash Alliance Digitalisation

Large businesses have encouraged smaller businesses to send e-invoices instead of paper invoices. This has helped include micro-enterprises into the formal, digital economy. For small and micro-enterprises, digitalisation has reduced the time taken to comply with tax obligations. Tax authorities have access to real-time information on the transactions by registered taxpayers while access to accurate, real-time information has improved the tax collection and auditing process.

Digitalisation changed the public perception of SAT, the Mexican Tax Administration, and there was an increase in trust in the organisation. There was also an increase in awareness of the penalties associated with non-compliance. There has been greater compliance as taxpayers realise the potential costs of non-compliance.[2]Where small entities previously used accountants to file their tax returns, returns can now be filed online by the owners without needing extensive knowledge of the tax system, thus reducing the cost of compliance. However, for entities without an IT system who were unable to access the SAT IT support centres, the cost of compliance increased as they had to invest in an IT system of their own.

Continuous updates and changes to the digital tax system has made the uptake difficult among smaller businesses. With every change to the system, owners need to invest time in understanding the rule change. In Mexico, this has been challenging for small business owners, especially women who have more domestic obligations, less free time, and money available to them.

1.3   Lessons from Mexico's experience

Table 1: Lessons from Mexico's experience – Taxpayer behaviours and response

Experience	Lesson
Despite strong progress with Mexico's digital programme, a lack of trust or understanding of digital platforms led some taxpayers to still present in person to tax offices and engage manually to be certain that they were meeting their obligations correctly.	Lack of trust can limit use of technology tools and undercuts the benefits of digitalisation. Tools and measures should be accompanied by communications with taxpayers about the full benefits of digitalisation.
There was confusion among some taxpayers about which systems to use in which circumstances.	To maximise the benefits from new technologies, a clear articulation of which

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[2] ibid

	technology to use in which circumstance can be helpful for intended users.
Continuous updates and changes to the digital tax system may have reduced the uptake among smaller businesses.	Upgrades and changes should be kept to a minimum or made automatic, if possible. Updates and changes that require action from business owners should be batched.
Low levels of digital payments overall in the Mexican economy are reflected in a low level of digital tax payments.	Measures that incentivise non-cash payments should be considered alongside digital measures. Tax Administrations would benefit from working with banks, mobile money providers and other similar stakeholders to support the expansion of digital payment methods and channels including mobile banking.

Table 2: Lessons from Mexico's experience – Government and tax administration actions

Experience	Lesson
Support from Congress and access to long-term financing that was not tied to annual budgeting processes allowed the SAT to invest in technology and deliver a multi-year transformation process.	Securing the highest-level support and access to long term funding that is not tied to annual budgets provides certainty to pursue long term multi-year strategic transformation.
A clear vision and strategy for Digital Tax Administration was set out early and has guided implementation for over almost two decades and under six different heads of SAT.	Setting out a comprehensive clear and compelling vision and roadmap is critical to maintain direction and continuity for the DTA transition strategy.
Mexico included a data strategy as a core part of its DTA journey from an early stage to improve internal Tax Administration operations and taxpayer services.	The roadmap should address data as the core input, and sources should be identified, and its role understood.
During the initial phases of the digitalisation process, separate components of the ICT system were designed independently, eventually resulting in issues with interoperability. This not only increased the total cost of the	The development of a common technological standard to improve information-sharing and establish output requirements for all relevant technologies. For example: product requirements, user requirements, and programme and product information for each

ICT system, but also created operational difficulties.	ICT component (rather than mandating how technology should be developed). This provides flexibility to procure and develop technology in the most cost-efficient way while ensuring that the components will be interoperable.
SAT streamlined its external and internal processes before starting the digitalisation process. For example, a change from multiple payment forms to a single federal tax form with multiple input lines.	Technological solutions will be more impactful if instead of simply replicating existing processes, those processes are reviewed and reconsidered in anticipation of changes in technology. Options may include streamlining, simplifying, or combining external and internal business processes.
The use of change management frameworks helped staff to develop new models for business operations, and subsequent organizational changes. New teams were created, such as the Administration of Digital Payments team, which works with banks to enable digital tax payments.	Developing a robust change management plan can help identify the internal human resource changes to deliver the digitalisation vision and strategy. The plan could identify the staff, skills, capabilities, and incentives required as training programmes to teach staff new skills.
A lack of competition in the banking sector impedes financial inclusion and incentivizes the use of cash. Limited channel options for digital payments also make it more difficult to develop and execute a more comprehensive strategy for digital tax payments.	An analysis of the wider context, such as local banking and financial services would assist in understanding characteristics that might disincentivise digital payments, and therefore digital tax payments. Non-tax issues (and addressing them) may have a critical impact on the success of tax solutions.
Lack of co-ordination between regional and central tax authorities can undermine the impact of digital tax measures.	Improving and ensuring coordination between different levels of government is key to the success coordinated, simplified, and integrated digital tax tools.
SAT put taxpayers at the centre of the digitalisation process. This was particularly important given the diversity of Mexico's taxpayer landscape.	Tailoring solutions for segments of taxpayers will be essential to increase uptake and financial inclusion.

2.   RUSSIAN FEDERATION - DIGITAL TAX ADMINISTRATION SYSTEM

2.1   Background and technology

The Russian Federation has implemented an economy-wide movement of small businesses to electronic record keeping, mandating the use of electronic/online cash registers since 2017. Tax authorities immediately process sales data, and buyers can use QR codes to verify receipts. The system is linked to a mobile app for SMEs, is integrated with the Russian automatic VAT control system and integrates with the Radio Frequency Identification (RFID) goods tagging system.

The Russian tax authority also has introduced a smartphone app called My Tax mobile app[3], specifically for self-employed persons. They can register in just a few minutes for this new tax regime with a mobile device, and keep income records, issue payment invoices, and pay professional income tax. Those participating in the programme pay a 4% tax on turnover, which is lower than the default rate. All the recordkeeping, tax payments and accounting are done "on the go" by the system, and the software solution also includes an API that allows banks and digital platforms to integrate taxes into their environment.

The app had more than 4 million users in early 2022, and offers multiple services, including:

- Specialist participating entrepreneurs
- Connecting the self-employed to customers seeking services
- Enabling tax registration
- Issuing receipts and documents receipt history
- Allowing self-employed persons to pay taxes
- Offering training courses via a messaging app
- Offering specialist services such as liability insurance, pension insurance and CRM.

2.2   Impact on tax administration and taxpayers

In Russia, the tax authority matches the amount of VAT paid to the amount of VAT claimed. All data is processed and analyzed in real-time (within eight hours). This data analysis allows the tax authority to identify tax risks quickly and efficiently. This system also allows for the monitoring of the tax authority and local authorities performance in tackling evasion.

These give the tax authority a real-time country-wide view of all transactions, affording a deep and powerful data pool to which to apply analytics and data tools. Russia is also seeking to use the data to analyse price and market trends in real-time for use in a regulatory context.

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[3] Federal Tax Service of Russia (2022), *Mobile Tax Application "My tax",* Приложение «Мой налог» (nalog.ru)

This system led to an increase in VAT collection by 16.8%, 12.2% and 8.5% in 2014, 2015 and 2016, respectively. In 2017, there was a 38% increase in VAT collection compared to the previous year. The VAT gap has fallen from 20% to 1% between 2014 and 2018. There was also a reduction in the number of field audits required, reducing the cost of administering the Russian tax system.

The My Tax mobile app is seen by the tax authority as key to improving the quality of services provided to the self-employed, enabling them to work legally without submitting reports or physically visiting the tax authorities[4].

For users of the app, there is no need to submit any reporting or returns. Taxes are deducted automatically on a transaction-by-transaction basis. Thus, the software solution provides an end-to-end seamless experience for this category of taxpayers. This reduces the time they must spend on compliance, giving them more time for other productive activities.

2.3 Lessons from Russia's experience

Table 3: Lessons from Russia's experience

Experience	Lesson
The inclusion of an incentive, such a lower tax rate for those adopting online or digital tools, can facilitate uptake.	Tax authorities can benefit from using incentives to positively change taxpayer behaviour and encourage update of digital tools. These may include not only incentives for taxpayers to use technology, but also demand side incentives to encourage consumers to demand digital transactions and receipts from businesses.
The introduction of a simplified tax (4% tax on turnover) in conjunction with the app incentivised taxpayer adoption, making compliance simpler and easier.	New technology can make existing analogue practices quicker, but it can be even more transformational if coupled with a rethink and simplification of existing processes.
The introduction of real-time data analysis, led to an increase in VAT collection, while the VAT gap fell from 20% to 1% in just four years.	Technology can be a valuable tool for tax administrations in reducing the tax gap. Russia's experience shows VAT as one tax

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[4] The Moscow Times (2022), *New tax scheme lures 4 million Russians to self-employment*, New Tax Scheme Lures 4 Million Russians to Self-Employment - The Moscow Times
https://www.themoscowtimes.com/2022/01/24/new-tax-scheme-lures-4-million-russians-to-self-employment-a76132

	where technology may particularly make a big difference.
Real-time monitoring and data analysis reduced the number of field audits required by tax authorities, lowering the cost of tax administration.	New technologies can enhance the productivity of supervision and enforcement by increasing the number of productive audits and reducing the number of non-productive interventions

3. KENYA - TAXPAYER APP

3.1 Overview and technology

Kenya benefits from a population with a high level of adoption of digital payments – it ranks first in the use of digital payments across Africa[5]. It is therefore particularly suited among developing countries for increased digitalisation of tax payment and collection. Kenya began a process of implementation of mobile technologies in tax administration in 2013, under the umbrella term M-Service. In 2020, the Kenya Revenue Authority (KRA) introduced a mobile phone application that simplifies access to various KRA services. Branded as KRA M-Service App, the system enables taxpayers to access various services offered by the Authority such as taxpayer registration and verification, filing of returns and payment of tax.

The system aims to widen taxpayer reach, increase revenue collection, and enhance tax compliance by making tax payment process more convenient and reducing the cost of compliance by removing intermediaries. KRA M-Service App is intended to expand the tax base by on boarding the shadow economy players who cannot use computers. It enhances remote operations while addressing the capabilities of the shadow economy and micro-enterprise sector through e-commerce and m-commerce transactions.

3.2 Impact on tax administration and taxpayers

Through the App, taxpayers can register, pay, and file tax returns for Monthly Rental Income and for Turnover Tax obligations. Taxpayers are also able to register for Personal Identification Number (PIN), as well as perform checks on PIN, Payment Registration Number, Tax Compliance Certificate and confirm identity of tax authority staff. The App allows taxpayers to file nil tax returns for Income Tax-Residents and Non-Residents, Income Tax Partnership and Income Tax-Company, Value Added Tax, Pay as You Earn, Excise tax and Monthly Rental Income.

The App was accompanied by a review and simplification of compliance processes to make it easier for taxpayers to use. For example, registering a taxpayer required about 36 fields in the past. This was reduced to just four. The App has been downloaded over 100,000 times as of December 2022. It was initially introduced solely on the Android platform but is now also available on the Apple store. For taxpayers without smartphones, there is an Unstructured Supplementary Service Data (USSD) accessible by dialling USSD short code.

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[5] Business Insider Africa (2022), *Kenya ranks first in the use of digital payments across Africa, according to Visa,* Kenya ranks first in the use of digital payments across Africa ahead of South Africa, Nigeria | Business Insider Africa

Online reviews are currently mixed – with several users reporting difficulties in using the app. However, there are also positive reviews, with some taxpayers noting they can file their returns quickly, or able to use the app once given more information on how to use it. KRA reports that the app has expanded the tax base, with 23,000 Kenyans registered as new taxpayers on the app in 2020/21. Furthermore, compliance had increased with more than 14,000 taxpayers applying for a tax compliance certificate and 73,000 filing their nil returns.[6]

In the longer term, KRA expects the key benefits to be an increase in compliance amongst the informal sector taxpayers, an increase in tax revenues from sectors with low compliance levels, and a broadening of the tax base by recruiting more taxpayers. There are also plans to add new functionalities, such as enabling taxpayers to track the status of their refund applications, check the status of exemption and excise certificates etc.

3.3   Lessons from Kenya's experience

Table 4: Lessons from Kenya's experience

Experience	Lesson
Kenya has the highest level of adoption of digital payments in Africa.	External social and economic factors, including the adoption of wider digital technology, may make certain digital measures by tax administrations more or less likely to succeed. Leveraging technology and mechanisms that taxpayers are familiar with makes the task of tax administrations easier.
There were challenges to overcome before the app could be developed – alteration of existing laws was required. Some tax officers were also resistant to change.	Technology is only part of the solution. It is also necessary to first build the legal framework, as well as to secure the buy in within the tax administration for change. In the last respect, the support from senior management for change was valuable, as was the deployment of business transformation leaders within user departments to advocate for the changes.

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[6] OECD (2022), *Tax Administration 2022: Comparative Information on OECD and other Advanced and Emerging Economies*, OECD Publishing, Paris, https://doi.org/10.1787/1e797131-en.

Internal tax administration challenges included low skill levels of staff, and lack of equipment for testing and development.	Staff skill levels were addressed through training, while the lack of equipment was addressed through purchasing the necessary equipment.
While the mobile app was introduced in 2020, there was also a long-term strategy to use mobile technologies to deliver taxpayer services being implemented since 2013.	Having a long-term strategy and roadmap can assist tax administrations to make incremental and strategic progress towards their goals.
The App was accompanied by a review and simplification of compliance processes. For example, the number of fields required for a taxpayer to register was reduced from 36 to just four.	New technology can be more effective when it is accompanied by a rethink and simplification of existing processes.

4.   BRAZIL - E-INVOICING SYSTEM

4.1   Overview and technology

The Brazilian tax system is among the most complex in the world – with 64 different types of income and corporate taxes, four different VAT taxes, and layers of federal, state, and municipal tax all laid atop one another. Brazilian tax compliance is estimated to be one of the most arduous in the world – one measure estimated that hours required for an average business in Brazil to comply with its tax obligations in 2021 was five times the regional average, and ten times the average of high-income countries.[7]

Since 2002, the Brazilian authorities have been building a regulatory regime that is based on four pillars of modernisation: electronic invoicing, accounting, tax, and payroll. The largest change has been the rollout of a mandatory standard electronic format invoice for goods, applicable to all companies, starting in certain sectors and for larger companies and steadily rolling out since 2009. The Nota Fiscal eletrônica (NF-e) form must be created whenever a taxable act takes place, and the process of issuing this form automatically passes a copy to the tax authority for approval. In this way, in theory, all sales and purchases are in real time submitted to the authority, allowing for robust analysis of the Brazilian economy and the detection of sales tax fraud.

When an invoice is submitted, it is passed to the tax authority first for recording and format approval checks, before then being passed on to the customer. This way Transactional accounting and tax data also must be submitted electronically and according to a prescribed format. In addition to the digitalisation of invoices, Brazil also requires all companies to submit transactional accounting information in a prescribed electronic format to the tax authorities, again providing the Brazilian government extensive insight into companies' activities[8]. This has made it easy for tax authorities to verify if taxes declared and paid coincide with the invoicing, increasing tax transparency and compliance.

To further help reduce the size of the grey economy, many states provide consumers with a small VAT rebate when their purchases are lodged with the tax authority.

4.2   Impact on tax administration and taxpayers

The implementation of the electronic invoice (the Nota Fiscal eletrônica) was expensive, both for the government and for companies to comply with. Nowadays many off-the-shelf ERP

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[7] World Bank Group (2021), Ease of doing business in Brazil, Doing Business in Brazil - World Bank Group
[8] IADB (2022), *Brazil reaps benefits of digitizing its invoices,* Brazil reaps benefits of digitizing its invoices (iadb.org)

solutions that comply with the NF-e legislation are available, but these took some time and expense to implement – the cost of bringing in a system was estimated by one interviewee as 10–15% of the cost of a full new accounting system.

Tax authorities have gained real-time insight into transactions and greater compliance with VAT reporting. Transactions which would have previously been audited by tax authorities on a sample basis, can now all be verified, in real time, with less staff and paperwork.[9] The provision by some States to consumers with a small VAT rebate when their purchases are lodged with the tax authority motivates consumers to report missing transactions, improving compliance, and identifying fraud and error. New and innovative uses of the data obtained by tax authorities from e-invoicing are being found and developed. The state of Rio Grande do Sul has developed a free app menor preço (low price) that uses real-time information obtained by e-invoicing and allows users to find the lowest price of a product in their location.[10] The information is updated in real time every time an establishment makes a retail sale.

4.3   Lessons from Brazil's experience

Table 5: Lessons from Brazil's experience

Experience	Lesson
While the tax system and complex government of Brazil are substantial challenges, the fact that the system has been built nonetheless shows that even a difficult digitalisation process can be implemented.	The electronic invoicing regime in Brazil is an example for any other government considering similar measures that the challenges of tax system complexity, and a combination of local, state, and federal taxes, can both be overcome.
The implementation of e-invoicing required multiple federal entities and the central government to agree and act in a coordinated manner. A new Fiscal Management Commission (Coget) was created to coordinate implementation, bringing together representatives of the states, the Ministry of Economy, and the federal revenue service.	Where reforms involve multiple departments or levels of government, co-ordination is a major challenge. Existing structures may not be best placed to cooperation. Brazil solved this with the creation of a new entity focused on coordination, giving all major stakeholders a role in the decision making.

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[9] Ibid.
[10] Menor Preço Nota Gaúcha - Apps on Google Play

Standardization of documents and procedures among the states was promoted to improve the effectiveness of the system.	The standardization and simplification of documents and procedures is valuable, especially so where multiple bodies may be involved.
Digitalisation and simplification of procedures lowered the cost of tax compliance, and even contributed to an increase in workers in the formal sector of the economy.	Digitalisation can increase tax revenue both by improving efficiency of collection of existing taxpayers and grow the tax base by bringing in new taxpayers. Lower compliance time and cost are positively correlated with higher compliance rates.[11]
To ensure states could process the e-invoices, there was a programme to help them update their technology, as well as guaranteed training for public servants.	Different levels of government should also be considered when designing funding, investment, and skills training programmes for digital tax initiatives.
Looking forward, Brazil is examining ways (under a programme called Profisco II) of making the most of the possibilities provided by big data to use the tax information available to achieve better fiscal management, especially with regards to finances and public spending.	Beyond the benefits for tax administration, it can be possible for the data collected to be used for broader government objectives, e.g., financial management and spending governance.

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[11] "Coolidge, Jacqueline. 2010. Tax Compliance Cost Surveys : Using data to design targeted reforms. Investment Climate in Practice; No. 8. World Bank, Washington, DC. © World Bank.

5.   THAILAND – DIGITAL TRANSFORMATION STRATEGY

5.1   Overview and technology

The Thai Revenue Department (TRD) developed a D2RIVE strategy to encourage digitalisation throughout the TRD. As part of this strategy, the TRD created a specific division – the Centre for Data Innovation and Intelligence. The purpose of this division is to use data analysis to enhance tax collection and the effectiveness of taxpayer services. The TRD also uses this division to improve the knowledge of officials by implementing learning through a variety of tools, where officials are required to upskill and develop their knowledge on topics such as data science. The TRD uses a platform called RD tax school which contains a high number of online courses which officials can access at any time.

The National Digital Identity Platform (NDID) was created as a form of self-identification for Thai nationals which relies on official forms of identification held by the user of the platform. The TRD has implemented the NDID to provide users with enhanced protection of their identity and to provide further security for transactions carried out online. The Bank of Thailand and the producers of the platform are testing a project in which the NDID is used in the e-filing of personal income tax returns.

5.2   Impact on tax administration and taxpayers

In the Centre for Data Innovation and Intelligence division, the TRD has hired technical experts to solve technological problems and drive digitalisation in line with the strategy. The division is split into several areas of expertise such as Application Architecture. The hiring of digital experts allows more efficient implementation of technology, and the sectioning of the division into specific areas allows the development of specialist expert knowledge.

The NDID platform pilot for use in the filing of tax returns was launched on 18 March 2021. Since the launch, a reasonable number of taxpayers have used the service and partner banks and the creators of the platform continue to encourage its use.

Taxpayers will have a smoother customer experience because of this initiative and the filing of their tax information has been made more secure. The tax administration also benefits from the increased security of the tax information as this helps to prevent fraud. Additionally, the use of this system has resulted in lower operational costs for the tax administration.

5.3 **Lessons from Thailand's experience**

Table 6: Lessons from Thailand's experience

Experience	Lesson
Potential users are not aware of the NDID platform.	Measures to educate and increase, awareness may increase uptake and use of taxpayer facing digital tax administration tools.
The NDID platform pilot for use in the filing of tax returns was launched and partners and creators continue to encourage its use.	Pilots are useful in proving business cases for digital tax administration tools. They can also allow tools to be modified to best meet needs and objectives. Early adopters can be powerful advocates for initiatives.
Different skill sets are required by tax administrations to implement digital tax initiatives.	Collecting digital and technical expertise within a 'centre of excellence' can drive digital tax administration innovation and incubate best practice.
New digital skills are needed throughout the tax administration.	External specialists as well as online learning platforms can be a quick way to access specific expertise and can be used to build the technical capacity of a tax administration.

6.   SINGAPORE - DIGITAL IDENTIFICATION OF TAXPAYERS

6.1   Overview and technology

Whilst not a low-or middle-income country, Singapore is an optimal example of what a relatively small country can successfully achieve in terms of tax digitization. Singapore have been the leading pioneers in tax digitization, using a National Digital Identity (NDI). NDI consists of Singpass (Individual) and CorpPass (Business), which are connected to multiple government agencies that include tax authorities, providing ease for taxpayers to conduct transactions with the government via a mobile-friendly user interface.

Each taxpayer has a unique Tax ID registered under their National Registration Identity Card (NRIC) that creates a distinct digital identity within the tax administration system.
User data is highly protected as account passwords are required to be changed regularly. Since 2015, the app has also implemented security enhancement methods such as two-factor authentication (2FA), face verification, and one-time password (OTP).

6.2   Impact on tax administration and taxpayers

Taxpayers can obtain information on their paid and payable taxes amounts. Furthermore, that information can also be used to claim other benefits based on specific touchpoints such as housing application, pension savings, insurance purchase, etc.
The digital identity facilitates advanced profiling and improves risk management and the audit process. This improves overall enforcement and increases the chance of identifying traders operating in the shadow economy. This technology also has the added benefit of making the payment process more efficient and user friendly for taxpayers.

6.3   Lessons from Singapore's experience

Table 7: Lessons from Singapore's experience

Experience	Lesson
High level of data security built into digital tax administration tools and processes	Data security and protections are important in building taxpayer trust in digital tools and systems. Data protections and security need to be built in from the beginning to preserve taxpayer confidentiality and build taxpayer trust.
NDI has become a reliable source on citizen's information and credentials	A secure, reliable, and credible national identity system can become a widely used

	verification of any citizen's identity, information, and credentials.
The NDI has become a 'one-stop-solution' app for all tax related purposes	A universal national digital identity can be designed as a cross government platform for delivery of many government services.
The government can use data that utilizes NDI to monitor the activities of its citizens.	A universal government digital identity can allow visibility over broader economic indicators, trends, and processes on a more timely basis.

7.   SERBIA - DIGITAL TRANSFORMATION STRATEGY

7.1   Overview and technology

Serbia tax authorities started their digitalization journey in 2005, when online reading of cash registers was introduced. Some years later, tax forms for VAT, pay roll taxes and personal income taxes were digitalized, and today it is possible to submit all tax forms online through the TA's web portal ("ePorezi"). By 2017, the Office for IT and e-Government was formed, when projects such as the State Data Centre, e-Payment, e-Paper and e-Inspector started.

In addition, Serbian TA recognizes the potential of digital platforms assistance in enhancing tax collection strategies and tax enforcement actions. Serbia is identifying non-compliant segments of the economy through the collection of third-party databases and big data analysis. Based on this, Serbia is developing a compliance plan and proposing tools for reducing identified gaps. The country is using soft tools, rather than tax audits, to approach taxpayers. The pandemic has reinforced the use of virtual platforms and hence, TAs need to be prepared for virtual interactions with their taxpayers. Digital platforms can play an important role in tax collection.

7.2   Impact on tax administration and taxpayers

During the digitalization process, following the principles of a digital roadmap, the TA compared the reality in an analogue age with the one of the current digital age. It was observed that taxable transactions and information about them used to have a separated time flow (i.e., there was a time gap), but in a digital age taxable transactions and information about them has similar time flow (i.e., information in real time). The number of audits were less than the number of transactions before, but now these numbers are equal. The goal is to direct physical audits to the right people and complete online, distant audits. The delivery of documents in a digital age is also faster. There was an automatic creation of tax obligation from databases and pre-filling by TAs.

It is recognized that digitalization, as one of the priorities of the Government of the Republic of Serbia, transforms the way of work of public administration and raises its economy, transparency and quality of work.

7.3   Lessons from Serbia's experience

Table 8: Lessons from Serbia's experience

Experience	Lesson
The digitalization of revenue authorities is a comprehensive process that requires a robust legal framework. The regulatory framework, which is not aligned with the needs of the digital environment may pose constrains for the usage of innovative solutions. The lack of flexibility in adapting legal frameworks is often an obstacle and taxpayers may experience slower adaptation of modern solutions in providing tax services.	The implementation of digital innovations by tax administrations should be accompanied by the legislative reform. Drafting new laws or updating the existing ones requires input from multiple stakeholders in order to obtain insights into the challenges related to a particular area and the ways to overcome them.
Tax authorities of developing countries often experience challenges in data acquisition and data protection.	Tax administration has to ensure valid sources for taxation through access to data in public registers and data from taxpayers' books, as well as the balance between the protection of personal data. The need of the TA to dispose of data always has to be 'filtered' by the provisions of legislation (e.g., Law on personal data protection; Commissioner for information of public importance; EU directives, such as General regulation on data protection).
Serbian tax administration needed to ensure that both tax officers and taxpayers possess necessary level of digital literacy in order to use the new digital tools.	The governments of developing countries should provide capacity building programs for the tax administration's employees' upskilling and reskilling. Additionally, the taxpayers should have access to training programs to obtain knowledge on tax compliance and the use of digitalized systems.
The implementation of innovations in the work of tax authorities necessitates addressing the challenge of resistance to change.	The digitalization reforms should imply change management programs that include implementing strategic oriented documents, which requires dedicated, strong team with skills in project management; for employees within TA, dedicating

	reform activities while avoiding a conflict with day-to-day job; monitoring and timely identification of risks; developing a robust system of incentives and sanctions.

8. THE REPUBLIC OF NORTH MACEDONIA - DIGITAL TRANSFORMATION STRATEGY

8.1 Overview and technology

North Macedonia has a vision to become a professional recognizable model of best practices and quality standards in the digitalization area. The mission is to provide simplified tax procedures and high-quality services to taxpayers, accurate tax returns and timely collection. The use of ICT has always been an important and integral part of the effective functioning of the tax administration, ever since the older tax registries and taxpayers' accounts to todays' modern integrated tax administration system (TAMIS).

From November 1, 2017 to January 31, 2019, the project for "Development and reengineering of business processes for the new tax integrated IT system" was implemented to define work processes and introduce modern ICT to provide reliable and secure IT system, for a service-oriented tax administration system. The new structure of the ITC model is already established with the help of the EU, while the completion of the implementation of all stages of the new systems is expected to end in the next years.

In 2017, TAMIS, a new integrated system, was introduced in PRO in order to provide optimal processes for collection, reporting, analysis, and management. TAMIS offers a holistic view of both taxpayers' and tax administration's needs. TAMIS focuses on operative efficiency, increasing revenue by monitoring compliance, improving taxpayers' services, optimization, and risk management by taking into account relevant legal regulations.

The IT Strategy of PRO from 2019-2022 was structured in priority items:
Priority 1: Introduction of electronic tax administration and digitalization of the tax services through Introduction of integrated tax information system (ITIS) - the new ITIS is being developed as its own instead of commercial off-the-shelf system (COTS) due to budget, time constraints and sustainability issues.
Priority 2: Service oriented organization for managing the IT operations.
Priority 3: Advancing policies for security, safety and sustainability of the IT systems.

The components of the new ITIS include:
- Registration: new Masterfile (Registers of entities – taxpayers; Registers for tax purposes; Auxiliary registers and ciphers; Registration of system users; Taxpayer registration file and reports; Data exchange with other institutions and other parts of PRO's IS Services for taxpayers; Registers of taxpayers for the registration of which other institutions are responsible (Central Registry, chambers, etc.)

- New tax accounting (Duty records; Generation and administration of posting orders; Payment processing; Calculation, generation and posting of interest; Reports and reviews; Procedures for data exchange with other systems in the PRO; Synthetic and analytical tax cards; Automatic procedures for offsetting claims and debts and refunding and redirecting overpaid tax; Administration of warnings/notifications and prohibitions; Debt management software will be launched this year).

- New e-tax (on-line registration of taxpayers – electronic filling, signing and submission of electronic tax returns and other types of submissions; review of submitted tax returns and other electronic submissions by status, possibility for their printing; insight into tax records by types of taxes; establishing an electronic order for payment of tax and other obligations; electronic payment of orders through a virtual POS terminal; electronic tax reminder services; 24x7 availability of electronic services).

- Tax assessment (the software solution for determining the taxation on the basis of PIT, except for the part of salaries, is in operation from 01.01.2018; upgrade of the software solution for monthly calculation for integrated collection and personal income tax, tax balance is in process; this year, the development of software for determining the taxation on the basis of profit tax and VAT will begin).

- Tax procedure: the development of a software solution started in 2021 for conducting tax procedures in the area of tax assessment and audit/inspectorate file.

Currently, there are several ongoing reforms in North Macedonia, aiming at promoting voluntary taxation, improving the effectiveness of tax administration and of business environment. These initiatives require further strengthening of the IT systems and the development of appropriate functionalities. The future projects to complete IT IS are the introduction of modules for e-commerce and e-invoice, establish a Data Warehouse, establish Business Intelligence Tools as Components for Risk Management, Compliance and Fact-Based Decision Making, establish Disaster Recovery Center and perform activities to increase the safety and security of IS.

8.2   Impact on tax administration and taxpayers
The introduction of the revised user-friendly procedure for computing and settling personal income tax liabilities not only brought numerous advantages but also resulted in a reduction of administrative burdens and the elimination of certain obligations for submitting returns and reports to the PRO.

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However, the administration still faces issues to be dealt with in the future: How to achieve real time compliance, transparency, service orientation, constant availability, automation of processing, e-administration, monitoring tax assessment and verifying tax liabilities (i.e. tax subjects, type of tax, tax period), customer relations and management taxpayers' compliance.

8.3 Lessons from the experience of the Republic of North Macedonia

Table 9: Lessons from the experience of the Republic of North Macedonia

Experience	Lesson
The previous experience of digitalization of tax function in North Macedonia was associated with partial and compartmentalized systems, which resulted in higher risks. In the beginning of the digital journey, the tax administration had problems with the procurement of software, which led to them building their own partial modules.	The digital transformation of tax administration is a gradual process that requires robust procurement policies. Countries, especially those facing funding issues, might consider building the new tax solutions on the existing cloud-based infrastructure, which mitigates a lot of risks. The digitalization can start from a limited number of tax functions, such as the personal income tax, and then be expanded on registration and accounting. Integrating partial modules in the system has less risks than a massive integration.
The process of digitalization requires a comprehensive reform. Developing countries often lack resources and capacity to achieve the goals stated in their digitalization strategies.	Developing countries should consider cooperation with international organizations (e.g., the World bank, IMF, EU) to get access to various programs implying funding, technical assistance, trainings. The Government of North Macedonia is working with international partners to achieve its goals, in particular the EU (The Twining project "Improving Revenue Collection and Tax and Customs Policy"), the IMF (Tool for diagnostic assessment of the tax administration (TADAT), the World Bank (project for Supporting the Public Revenue Office IT system Design and project for financing the development of the new IFMIS and the expansion of the new information system of the PRO).

9.   KAZAKHSTAN - DIGITAL TRANSFORMATION

9.1   Overview and technology

In Kazakhstan, the development of the IT infrastructure is focused on the launch of three new information systems: electronic invoicing, risk management system, and an integrated database. The tax administration has been working actively on improving tax compliance and the behavior of taxpayers. The approach has been shifting to a client-oriented approach, transforming from supervision and policing in relation to taxpayers to partnership, consultancy and mentoring of taxpayers.

The country's TA applies a risk management system and monitoring in which taxpayers are classified in different groups. There are taxpayers with good will (for them, the goal is to create the most favorable conditions); a second group of taxpayers are those that pose some risks (for them, there should be assistance to improve their compliance); and a third group are the ones who apply fraudulent schemes (for them, rules should be enforced). The authority applies AI and big data collected from electronic invoice, tax accounting, databases from third parties and declaration of goods in order to categorize the taxpayers, identify hidden irregularities and anomalies and apply advanced analytics and linkage identification. There is a horizontal monitoring in this system: large taxpayers provide access to their accounting systems. For taxpayers with a high violation level, the system sends a remote notification for elimination of violations without tax audit.

In 2020, the TA launched the 'e-Salyq-Azamat' electronic tax wallet mobile app. The app can be downloaded free of charge and enables citizens to check imminent tax amounts prior to the date of its payment as well as making payments based on indicated bank details. Previously, a taxpayer had to visit a bank, wait in a queue, pay a bank fee and select bank details and codes to make a payment for a tax. In addition, the tax wallet allows for electronic requests to authorized agencies for correction of data related to taxation objects, avoiding the need for taxpayers to visit a number of different agencies. [12]

The roadmap for the introduction of the 'e-Salyq-Azamat' app was the following:
- Updating databases of authorized bodies on property, transport, land
- Work with territorial divisions and amendments to legislation
- Automatic integration with government agencies

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[12] See "e-Salyq-Azamat" Electronic Tax Wallet mobile app | Electronic government of the Republic of Kazakhstan (egov.kz)

- Launch of the 'e-salyq-azamat' mobile application
- Popularization of a mobile application for paying taxes.

The advantages of paying taxes through e-Salyq-Azamat are the exclusion of filling-in a lot of details, auto payment, auto writing off and online replenishment within 2 minutes due to repayment of debt and upcoming payments, receiving alerts, direct integration with banks, viewing and adjusting objects of taxation and overpayment management.

9.2   Impact on tax administration and taxpayers

In Kazakhstan, the electronic invoicing system has contributed to an increase in VAT revenue by almost 1 billion USD. The use of the electronic invoicing system and ICT helps prevent fraud and VAT evasion, ensuring transparent movement of goods.[13] In addition, implementation of the Resk management Systems contributed to generating an additional revenue of 204 million USD for the national budget.[14] According to the recent estimates, digitization of tax administration has led to a 9% reduction in tax audits and nearly a 20% increase in revenues to the budget of Kazakhstan.[15]

Over the last years, the TA in Kazakhstan has been receiving positive feedback from the implementation of the mobile application 'e-Salyq-Azamat'. In 2020, there was 775 thousand mobile app users; 369 thousand accepted forms of reporting on general declarations; 10 thousand individuals submitted applications for the adjustment of transport; 116 million KZT by recharging a wallet and 599 million KZT used the overpayment. But the TA is constantly improving their strategy and efficiency, focusing on improving the efficiency of systems, information security of systems, digitalization of tax and customs administrations, and focusing on professional team of IT employees.

The Kazakhstan State Revenue Committee recognizes that modern trends such as social networks, mobile technologies, active social society and emerging technologies such as blockchain, AI and big data create new challenges to TAs with regard to the traditional way of doing business. It also opens up new opportunities to improve TAs approach. Some of the key challenges are cultural and behavior challenges, lack of understanding of digital trends, lack of talent for digital, lack of IT infrastructure, organizational structure not aligned, lack of dedicated funding, lack of internal alignment, business process too rigid, lack of data and lack of senior support.

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[13] Казахстан: На пути к более динамичной экономике через эффективное электронное администрирование доходов (vsemirnyjbank.org)

[14] Казахстан: На пути к более динамичной экономике через эффективное электронное администрирование доходов (vsemirnyjbank.org)

[15] https://primeminister.kz/ru/news/press/cifrovizaciya-nalogovogo-administrirovaniya-pozvolila-uvelichit-postupleniya-v-byudzhet-pochti-na-20-b-sholpankulov

9.3   Lessons from Kazakhstan's experience

Table 11: Lessons from Kazakhstan's experience

Experience	Lesson
Strengthening the relationship between a tax administration and taxpayers needs conceptual change, which could be achieved through remote operational access to information. However, the access to the taxpayer information is limited due to a relatively small number of taxpayer services provided digitally.	The interaction and exchange of information between governmental agencies and taxpayers should be facilitated using digital technologies. The limited number of digital taxpayer services needs expanding, while procedures for providing existing services should be revised and improved. The real-time access to the large taxpayers' data can be gained through launching a horizontal monitoring program facilitated by the use of technologies.
The functioning and development of information systems at the Committee of State Revenues were carried out in violation of the legislation of the Republic of Kazakhstan in the field of informatization.[16]	Implementation of digital reforms in the area of tax administration requires not only developing a legislative framework, but also establishing a set of robust measures for the enforcement of the regulations and monitoring the compliance with them. Censuring the compliance with the regulations needs the political buy in and strong leadership.
Notwithstanding the digitalization reform, there was a large underpayment in the consolidated budget, which was increasing in 2021-2022.	Simplification of taxpayer services is not a panacea. Tax administrations might consider improvement of tax audits based on digital technologies as well as implementation of electronic fiscal cash devices to combat informal economy.
The plan of development of the Ministry of Finance of the Republic of Kazakhstan does not include target indicators for the digitization of tax control and the effectiveness of measures for forced collection of arrears.	The digitalization reforms require setting up a set of Crucial Success Factors and Key Performance Indicators for monitoring the progress and identifying and addressing the challenges in a timely manner.

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[16] https://www.gov.kz/memleket/entities/esep/press/news/details/614624?lang=ru

10.   REPUBLIC OF KOREA - DIGITAL TRANSFORMATION

10.1   Overview and technology

Korea has been developing its ICT systems in tax administration and its strategy toward digital tax transformation since 1967 (Awasthi et al., 2019). In 1967 the National Tax Service (NTS) system was founded. Later, Korea aimed for a Tax integrated system (TIS). The latter is a full-fledged implementation of an e-tax administration system that was launched in 1997. It relied on the collection and analysis of massive amounts of taxpayers' financial data in 1994-1996. The TIS however was basically designed to enhance the proficiency of the tax administration's workflow and has provided less improvement in tax services. The TIS has been complemented by the Home Tax Service (HTS) initiative in 2002. HTS provided for an internet-connected electronic filing system that simplified the computerized work of tax officials and enabled the taxpayer to file and pay taxes from home and work through the internet.

In particular, the services provided by the HTS include:

- E-fling, covering direct/indirect taxes and surtaxes by creating tax returns and attached documents on a PC.
- E-notice provided by HTS via the internet or mobile devices,
- E-payment for all taxes, simply by entering bank account information on a payment interface.
- Simplified Year-End Tax Settlement Service to collect tax deductible or creditable payment information from hospitals, schools or financial institutions through IT networks.
- Online submission and issuance of tax related documents, such as tax exemption documents, tax-related forms, business registration certificates and tax payments certificates, by using Civil Certification Internet Access Service, and
- Automatic calculation of income taxes, tax exemptions, and gift taxes, and submission of taxation data in written or computer forms, such as daily working income payment statement, liquor sales records, etc.

In 2011, Korea established the mandatory Electronic Tax Invoices (ETI) system for claiming VAT input tax credits. Initially, ETI was offered as a voluntary alternative to paper-based invoices but due to limited or no use by taxpayers, the Korean government decided to make the ETI compulsory. This was done first by preparing the necessary regulatory framework and secondly, by certifying ETI issuers and service providers. In 2009, Korea launched a dedicated website e-Invoice Issuance System (e-sero), through which taxpayers who could not prepare the ETIs on their own could log into the system and obtain one for free.

In 2012, the NTS launched an early-warning system (EWS) to combat VAT fraud and identify input tax credit fraud. One of the key functions of EWS is to electronically verify VAT return information at an early stage, by cross-checking taxpayers' sales and purchases and screening suspicious refund claims (Awasthi et al., 2019, p. 51). Because of VAT fraud incidents and the focus on addressing B2C transactions (especially cash transactions), the primary focus of the Korean TA was to be able to electronically trace payments by promoting credit/debit card payments and by asking retailers for electronically traceable cash receipts (ETCR). As a result, electronically traceable payments (ETPs) were increased sharply.

Furthermore, Korea decided to address taxpayer services improvement quite recently by the creation of the Next-Generation Tax Integration System (NTIS) which was launched in 2015 and provided an integrated taxpayers' service portal for external users and a NTS single-window portal for internal users. These portals allowed tax authorities to analyze big data and provided tools to better manage taxpayers' tax and other information. NTIS is a renovated system that runs on Java, generating and processing of data by setting up its Data Quality Management System to speed up the system and to reduce data error (Awasthi et al., 2019, pp. 31–32). Tax services currently offered digitally in Korea are online filing, online payment, integrated taxpayer accounts, other online services and digital mailboxes.

10.2   Impact on tax administration and taxpayers

The introduction of digitalization in tax administration has yielded numerous positive outcomes in terms of tax compliance and collection. It has significantly enhanced the tax authority's ability to identify taxable income more effectively. The establishment of a fair and user-friendly e-taxation system has minimized tax resistance, promoting voluntary tax payments. These factors, in combination, have led to a substantial increase in overall tax revenue in Korea, which has surged from 1996 to approximately 320.8 billion USD. [17] The tax-to-GDP ratio excluding social security contributions increased by 3.2 percent points from 1996 to 2018, reaching 20 percent by 2018. Similarly, the tax-to-GDP ratio, including social security contributions, experienced an 8.6 percentage point rise during the same period, reaching 28.4 percent in 2018. [18]

Digitalizing tax administration has played a pivotal role in uncovering concealed sources of taxable income, especially among the self-employed, resulting in a broader tax base overall. Since the introduction of the Tax Information System, the number of taxpayers has soared from 6.8 million in 1996 to 18 million in 2018. The tax base for the three main tax types, constituting

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[17] A Roadmap for Digitalization of Tax Systems: Lessons from Korea (iadb.org)
[18] A Roadmap for Digitalization of Tax Systems: Lessons from Korea (iadb.org)

81 percent of total taxpayers, has expanded significantly: doubling for PIT, increasing fivefold for CIT, and growing 2.5 times for VAT. [19]

Advancements in technology, coupled with various tax schemes promoting a cashless economy and encouraging electronic evidence usage, have enabled the tracking and cross-referencing of transactional information for businesses and individuals. In 2018, 95.4 percent of private consumption expenditure could be traced through credit and debit card transactions or cash receipts. [20]

In terms of operational costs for tax administration, there has been a reduction in administrative expenses. Tax revenue collected per NTS official has increased from 3.29 million USD in 1996 to 12.42 million USD in 2018, indicating a 3.7-fold improvement in revenue collection efficiency compared to two decades ago. Simultaneously, the cost of collecting revenue of KRW 100 has nearly halved, decreasing from KRW 0.93 to KRW 0.58. [21] Moreover, e-taxation has lowered taxpayers' compliance costs and played a role in fostering a taxpaying culture. As of 2018, over 90 percent of tax returns for the four main tax types were filed electronically. [22]

10.3 Lessons from Korea's experience

Table 12: Lessons from Korea's experience

Experience	Lesson
In Korea, the introduction of e-taxation has not only enhanced efficiency but has also bolstered both the horizontal and vertical equity of the tax system. This, in turn, has significantly contributed to fostering trust among taxpayers.	Digitalization of tax administration can become a powerful tool for strengthening the equity of the tax system and achieving and contributing to the sustainable development. In the developing countries experiencing a high degree of informality, lack of infrastructure and low financial inclusion, corruption, fraud, etc. improvement of tax administration based on digitalization of revenue authorities should be based on a strong social consensus on the role of tax revenues as an important financing source for a country's sustainable development.

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[19] A Roadmap for Digitalization of Tax Systems: Lessons from Korea (iadb.org)
[20] A Roadmap for Digitalization of Tax Systems: Lessons from Korea (iadb.org)
[21] A Roadmap for Digitalization of Tax Systems: Lessons from Korea (iadb.org)
[22] A Roadmap for Digitalization of Tax Systems: Lessons from Korea (iadb.org)

	This requires efficient promotion to ensure the public buy-in of the reforms.
The efficient implementation of the mandatory e-invoicing system (ETI) in Korea required creating the necessary regulatory framework and standardizing and certifying ETI issuers and service providers. Additionally, the Korean government established an institutional framework to streamline an inter-agency information-sharing mechanism, ensuring the integrity, compatibility, and confidentiality of the data.	Incoherent policies and lack of coordination among institutions both within the government and between the private and public institutions may hinder efficient management of taxation data. The implementation of digital innovations in the work of tax administration should imply prior creation of the necessary regulatory and institutional frameworks.
The NTS hired over 350 IT specialists through the government's professional position system. These specialists are trained to serve as intermediaries between the NTS and externally contracted IT companies. They operate in dual roles: translating the specific needs of tax officials into the intricacies of IT systems and scrutinizing the systems developed by external companies to ensure alignment with tax regulations.	Governments should prioritize placing their policy objectives at the core of learning and adopting technologies from the private sectors of foreign governments. It is crucial to have professionals with expertise and extensive knowledge of information technology, tax laws, and administration to achieve this objective. Their active involvement in the system development and management process significantly increases the likelihood of successful digitalization. Relying on internal staff who take full charge of system development not only enhances information security but also ensures coherence and sustainability in the digitalization process.
The digitalization journey of the Korean tax administration started in mid-1990s, and it is constantly improving.	The digital transformation of tax administration is a gradual and comprehensive reform that necessitates significant socio-economic and legal changes. In developing countries, it might take generations to develop tax morale and assimilate the technical changes.

11.   CHINA - DIGITAL TRANSFORMATION

11.1   Overview and technology

In the People's Republic of China (PRC), the tax administration is not officially affiliated with the Ministry of Finance. The State Tax Administration (STA) is an independent agency of the State Council, and it performs various activities ranging from the drafting of tax laws to the collection of state and shared taxes. Additionally, the tax administration is also responsible for the collection of Social Security Contributions. In March 2021, the Chinese government published a Blueprint for Further Deepening the Reform of Tax Collection and Administration. The Blueprint sets out a 5-year tax reform plan with the political backing of the government; this is important because it makes the reform part of a systematic policy of the Chinese government and not just of the Tax Administration, which resonates with the whole-government approach advocated by the OECD.

As for the core information technology system used by the STA, the approach followed in China combines both in-house and externally developed solutions. Regarding the latter, both COTS and Custom-Built ICT solutions have been acquired. The TA has a website with general tax-related information in which various services are provided to taxpayers, e.g., e-filing, electronic invoicing system, access to taxpayers' data from third parties, digital mailbox, etc. Furthermore, the STA employs artificial intelligence through its Robotchat, a platform operating 24/7 that allows complex questions to be directed to human experts to ensure taxpayers' satisfaction. As a consequence of the pandemic, the STA expanded the electronic channels for providing more services to taxpayers. As a result, around 10 million entities and 100 million individuals were able to resolve 214 separate tax-related matters online.

In 1994, the "Golden Tax System (GTS)" was initiated by the State Taxation Administration (STA) for the payment and registration of VAT, and its last phase GTS III rolled out nationwide in 2019 to cover other types of taxes. Its aim is to create a unified platform that processes data at both the state and provincial level of tax administration, covering all taxes, all working stages of the tax administration, and encompasses both the State and Local Taxation Bureaus (STB and LTB) as well. This platform is similar to the Integrated Tax Systems identified above as it allows linking of data from different government departments.[23]

The Chinese GTS includes four systems, namely: (1) the tax collection system; (2) the external data management and exchange system; (3) the internal administrative management system; and (4) the risk management and supervision system. After the launch of GTS III, the tax

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[23] Comparing with the first tier LAC, we observe that a similar system is employed in Brazil which relies on blockchain technology.

administration of local tax bureaus and state tax bureaus is now merged. Specifically, at the provincial level, a system is created to facilitate the interaction between taxpayer and tax bureau including electronic self-reporting (e-reporting). Furthermore, the system cooperates with the IT systems of other governmental departments, including information sharing with the social insurance department, the Ministry of Land and Resources, and the Ministry of Commerce. Data analysis and risk assessment is made by the use of advanced technologies such as Big Data and AI.

In 2018, Blockchain e-invoicing of VAT was piloted by Shenzhen Tax Bureaus and Tencent, by which consumers can scan a QR code to pay for certain goods or services, download the invoice from the WeChat system, and at the same time, apply for online reimbursement through the corporate WeChat reimbursement system. The reimbursement information is synchronized and written onto the Blockchain cloud computing node of the Shenzhen Tax Bureau in real time, which is secured by a unique hash number that is open to authentication and that is traceable and unchangeable. However, such a system is not yet applicable to the special VAT invoice that is used for input of VAT refunds.

In 2018, the Personal Income Tax App was launched by the STA, comprising around 28 functions for individual income tax, such as identity authentication, information collection, facial recognition and special purpose deduction application. Furthermore, for the first time in 2020, China conducted an annual reconciliation of individual income tax returns comprising around 100 million individual taxpayers. In this regard, the STA made use of cloud computing, big data, and AI technology to provide taxpayers with pre-filed annual reconciliation of their individual income tax returns.

11.2   Impact on tax administration and taxpayers

Tax collection in China has undergone a transformation towards enhanced convenience and efficiency, thanks to digital advancements. The shift from traditional offline tax processes to online platforms signifies a notable improvement in tax management efficiency. This transformation is notably facilitated by the implementation of the Electronic Taxation Bureau, establishing an inclusive and intelligent tax collection service system for all taxpayers. With over 99% of tax-related tasks now accessible online, the system offers a high level of convenience. Taxpayers can effortlessly manage activities such as tax filing, invoice acquisition, and tax refund claims through the E-tax Platform, using a unique identification number provided by the tax authorities for efficient completion.

The oversight of tax activities has become more detailed and precise. Following the acceptance of taxpayers' tax returns, the tax authority engages in comprehensive supervision across all

aspects. In the digital realm, tax authorities can thoroughly analyze reporting information for various taxes over multiple periods and cross-verify data from third-party sources. The utilization of dynamic analytical models has further enhanced the efficiency and precision of supervision practices.

The tax audit process has seen improvements in robustness and efficiency. The application of regulatory models for case selection has increased audit efficiency, while the incorporation of computer algorithms for random selection ensures fairness and reasonability based on specified parameters such as range and years. Persistent data utilization plays a fundamental role in this transformation. The exchange of data among tax authorities has elevated management efficiency across departments. Similarly, data exchange among different entities brings various stakeholders and taxpayers into the fold, fostering a sense of participation in the tax governance process.

The widespread adoption of e-payment among Chinese consumers, coupled with the streamlined invoicing process and the benefits offered by Blockchain invoices, facilitates easy acceptance by consumers, businesses, and tax administrations. As per Tencent's 2018 annual financial report, WeChat had 1.08 billion monthly active users globally.[24] According to data from the China Internet Network Information Centre, by the end of 2018, 72.5% of mobile internet users were utilizing mobile payment services, including WeChat payment. Mobile payment has emerged as the primary means for residents' daily consumption. [25]

11.3   Lessons from China's experience

Table 12: Lessons from China's experience

Experience	Lesson
A vast population, extensive geography, and diverse circumstances and tax policies in each Chinese region pose challenges for harmonizing the tax system. This is evident in the variations between tax rules, administrative processes, and systems.	The process of digitalization of tax authorities in large developing countries may take many years and requires substantial investment. The process of digitalization needs developing the strategy at the state level and implies several stages of adopting the innovations.
China experienced the issue with staffing the SAT with appropriate professionals.	One of the factors contributing to the success of the digitalization reform is building the necessary capacity within the state

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[24] https://cdc-tencent-com-1258344706.image.myqcloud.com/storage/uploads/2019/11/09/9d13ada334b4c13cf86262ef6493172c.pdf
[25] https://www.cac.gov.cn/wxb_pdf/0228043.pdf

	administration. This can be achieved by upskilling and reskilling the employees by providing regular trainings to develop digital skills.
In China, the process of gathering evidence for tax violations has shifted away from traditional reliance solely on examining taxpayers' accounting records. Tax authorities now place increasing emphasis on utilizing third-party information and employing cross-auditing methods.	Reliance on third party data makes the process of fraud detection and evidence collection more streamlined and expeditious. However, promoting this requires developing a robust data governance framework.
The digitization of the economy has expanded opportunities for tax evasion and illicit activities, posing challenges for tax authorities in safeguarding the country's tax base and conducting effective tax audits.	It is essential to raise tax authorities' awareness of the risks associated with the digitization of the economy, such as exploiting the intangibility, virtuality, and high knowledge-intensity of the digital economy for profit transfer through virtual trading chains, fictional transaction entities, or artificially inflated intellectual property values. The solution to these challenges involves strengthening centralized processing and leveraging big data analysis.
Acknowledging the broadening and intensification of tax cooperation and governance, Chinese tax authorities are undergoing a transformative shift in their approach to tax administration. This shift moves away from solitary management toward comprehensive governance involving multiple departments and stakeholders.	Ensuring information availability necessitates multistakeholder cooperation and collaboration. This involves establishing a comprehensive taxation information platform to centralize the collection, analysis, and utilization of information from various departments. Simultaneously, the tax system shares its data with local government platforms by transmitting it to a centralized government data platform. This facilitates the exchange and aggregation of information across different governmental departments and systems. Moreover, these platforms can aid in delivering information on potential risks or errors to taxpayers promptly. This reduces the likelihood of tax audits, enhances trust in tax authorities,

	and fosters a sense of participation in tax governance.

12.   ZAMBIA - DIGITAL TRANSFORMATION

12.1   Overview and technology

The reform of tax administration in Zambia initiated in 2006 was part of a broader modernization program, which resulted in Zambian Revenue Authority's (ZRA) Corporate Strategic Plan. Its primary purpose was to increase the efficiency and effectiveness of tax administration by streamlining its business processes and, hence, improve revenue collection. The need to reform the tax administration could be explained, first of all, by the fact that paying taxes in Zambia was time consuming and costly for both tax authorities and taxpayers due to manual processing of tax returns, a fragmented and outdated administration system, lack of a single authoritative database, which increased the risk of errors.

The work on the digitalization project began in 2012, when the ZRA set up a project team to guide the development and implementation of the new electronic system, called *TaxOnline*. Due to time constraints, the ZRA opted for the commercial off-the-shelf product and contracted with Tata Consultancy Services (TCS), a private vendor that had developed and adapted an e-tax model for Uganda. As the result of the research on Zambian tax law and gap analysis, the project team members identified the differences between the e-system implemented in Uganda and the needs of ZRA (i.e., different types of taxes and tax returns, identification of taxpayers in the system, timeframes for debt collection, the turnover threshold below which a business paid only a flat tax, etc.).

Based on the study as well as active consultations with stakeholders, the project team determined the elements to be included in the modules and prepared blueprints for each of them, which were used by TCS for engineering works. The developer performed customization, while the responsibilities of the ZRA's ICT team included quality assurance, migration of data to the new system, and handling of infrastructure. *TaxOnline II* system, the next step of the digitalization of ZRA, was an in-house solution co-developed with the Copperbelt University ICT department.

The system launched in 2013 included the basic functionality a taxpayer needed to register with the ZRA, file tax returns and manage tax payments. The developments introduced at a later stage (*TaxOnline II*) included such modules as refunds, auditing, debt collection, investigations, simplified objections and appeals. The technologies used to implement the e-system in Zambia are reflected in the table below:[26]

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[26] Efficient Implementation and Maintenance of ICT Tax Systems in Africa: Compilation of Good Practices, Success Stories, and Lessons Learnt, ATAF 2021.

Table 13: Technologies used by the Zambian tax administration

Platform	Technology
Primary Server Infrastructure	EXADATA X8
Primary Operating System	Oracle Linux | Visualization
Storage	Net-App, HP | On Premise Cloud
Primary Programming Languages	JAVA
Databases	Oracle 12C, MS SQL Server

The implementation of tax reform encountered several challenges. Firstly, the ZRA faced unsustainable costs on support and maintenance of the new system, which was exacerbated by budget shortfalls. During the first two years of TaxOnline, the ZRA invested a total of $8 786 550 for the system, which included the setup cost and support and maintenance over that time period. The majority of the funding of the tax administration reform came from government of Zambia, but part of financing as well as technical assistance was provided by the Investment Climate Facility for Africa.

Second, implementation of the electronic system was challenged by tight deadlines related to customizing the solution according to the needs of the ZRA and launching the project. As a result, the tax administration had limited time to test the system before its actual implementation and for training the employees and taxpayers, which could have helped preventing some of the problems.

Third, ZRA had no access to source code to the system developed by the TCS, and its ICT staff received no training on the system, which made the tax administration dependent on expensive services of the vendor company if any further customization was required.

Fourth, there was the need for moving data to the new system. Migration of the demographic information on the taxpayers and closing balances for VAT and income tax for each taxpayer implied extracting data from the old fragmented systems and enriching the data by formatting them in a way that would work in the new system. To move other types of data, ZRA employees reconciled accounts on the old systems and manually inputted balances on the new systems, which allowed the ZRA team to prepare the system relatively quickly for the new users.

Finally, transitioning to an electronic tax administration system faced strong resistance from both the tax authorities and taxpayers, which required change management in order to promote cooperation and build trust. Institutional resistance within the ZRA was associated with the

potential reduction of work of data entry officers and employees of ZRA cash offices, which could have put those jobs at risk. At the same time, many taxpayers preferred conducting their tax compliance procedures manually, regardless the benefits of the electronic system, which could have also made tax avoidance more complicated and resulted in higher payments to ZRA.

Moreover, a significant part of the population of Zambia had limited access to the internet, low computer literacy and low tax literacy. In order to overcome this challenge, the project team employed the Change Management Officer whose primary role was to communicate with ZRA staff and taxpayers about the coming change and how it would impact them. The revenue authority ensured that employees would be redeployed to other assignments if their position became redundant as the outcome of the project implementation. Over 700 ZRA staff received training in how to process registrations, returns and payments through the TaxOnline system in order to be able to assist others. In addition, the ZRA held workshops and meetings with taxpayers to present the new system and teach how to register for and use it as well as to provide training in basic ICT to solve the issue of low computer literacy.

In order to promote the new system and reach out a large audience, the ZRA corporate communication office produced advertisements for radio, television, billboards, and newspapers. After the electronic system was launched, the tax administration established a call center and added more staff to its help desk to give taxpayers instant assistance. Moreover, the ZRA had to introduce new regulation in order to enhance online compliance. In particular, online filing became mandatory for VAT returns and for companies with ten or more transactions. Taxpayers filing online received a number of incentives including extended deadlines and amnesty for penalties and interest accrued in the period between 2013 and 2017 provided that the principal tax was paid, and all returns filed.

12.2   **Impact on tax administration and taxpayers**

Implementation of the TaxOnline system resulted in a number of financial and non-financial outcomes, which included the following:

- increase in timely payments from 59% to 65%;
- by 2019, over 90 percent of registrations were processed electronically;
- implementation of TaxOnline resulted in an increase in the number of tax returns filed online. In 2017, 98 percent of tax returns were filed and submitted online, while 2 percent were filed manually, which referred to small taxpayers who lacked internet access;
- by 2019, around 70 percent of payments were submitted to ZRA electronically;

- the time for filing, payment and processing of tax returns decreased from 10-16 days to 1 day;
- reduction of tax compliance costs for SMEs.

12.3   Lessons from Zambia's experience

Table 14: Lessons from Zambia's experience

Experience	Lesson
The time constraints experienced by the ZRA when implementing the digital reform, resulted in opting for the commercial off-the-shelf product that was customized in accordance with the ZRA's needs. At a later stage, the tax administration adopted an in-house solution.	The tax administrations of developing countries, facing a shortage of in-house IT professionals for developing their own digital solutions and under time pressure to implement digital reforms, may consider acquiring commercial off-the-shelf products. These products can be customized to align with strategic goals and specific socio-economic conditions.
In Zambia, the online system launched in 2013 initially provided basic functionality for taxpayers to register with the ZRA, file tax returns, and manage tax payments. Subsequent developments introduced additional modules, including refunds, auditing, debt collection, investigations, and simplified objections and appeals.	In the least developed countries, the digitalization of revenue authorities, while a desirable process, necessitates the gradual implementation of various digital tools. Countries can commence by developing an online portal that provides basic tax functions such as e-registration, e-filing, and e-payments. As digital maturity and experience grow, more advanced modules can be introduced at a later stage.
The ZRA encountered very high costs for the support and maintenance of the new system, exacerbated by budget shortfalls.	Developing countries might consider mixed financing digitalization reforms, which would include own resources as well as attracting technical assistance and funding provided by international organizations.
The tight deadlines set by the ZRA for customizing and launching the electronic system did not allow for proper testing before its actual implementation. As a result, the tax administration employees and	The strategy of digitalization of tax administration should include well-defined deadlines and control points. It is crucial to ensure that the developers have sufficient time for testing the digital tax systems and fixing the errors to prevent potential issues.

taxpayers faced numerous problems when using the new digital system.	
In Zambia, the transition to an electronic tax administration system encountered significant resistance from both tax authorities and taxpayers.	Overcoming the resilience requires adopting a robust change management strategy and hiring an expert whose role implies communicating the upcoming changes with the tax administration's employees and taxpayers as well as the future impacts. It is important to reassure the tax administration's employees that their working places are secured (e.g., by redeployment to other assignments), and they receive a proper training on how to use new technologies. Taxpayers should be provided with training to improve their computer literacy. Tax administrations might consider other methods to address taxpayers' concerns and potential issues, such as establishing call centers or help desks to provide advice.

13. LIBERIA - THE DIGITALIZATION OF TAX ADMINISTRATION

13.1 Background and technology

The effective and transparent administration of taxes represents an important role of any government. This function ultimately determines the scope of government's operations which includes its ability to provide basic public goods and services to its citizens, improve income distribution, support social programs, and ensure oversight and accountability. Efficient and equitable taxation is essential to long-term development, and a lack of tax revenue can force governments to rely on foreign aid which are less reliable and unsustainable as a development strategy.

After years of suboptimal performance in its tax administration, the Liberian Government in 2013 took up the challenge of instituting a modern semi-autonomous revenue authority. This move separated the function of revenue collection from the Ministry of Finance. This was meant to ensure the effective and transparent collection of both domestic revenues which would help the government finance much-needed public services. However, this feat seemed particularly challenging in the context of a post war period largely characterized by secrecy, unaccountable civil servants, the lack of reliable data on public finance for the periods before 2006, and a very tight fiscal space.[27]

Following years of preparation, the Liberia Revenue Authority (LRA) was enacted into law in 2013 and operationalized on July 1, 2014. The Institution is charged with the responsibility to oversee the administration and enforcement of Liberia's revenue laws for the purpose of assessing, collecting, auditing, and accounting for all national and international revenues. The LRA is also charged with facilitating international trade and customs borders management and enforcement. The role includes administering legitimate trade, customs clearance through the borders and social protection through policies and procedures that promote efficient, simplify, and enhance taxpayer compliance.

After the establishment of the LRA, it was immediately realized that the optimization of domestic revenue collection was an essential component to Liberia's long-term fiscal independence and economic development. With the demand for improved domestic resource mobilization and accountability on the rise from both the government and taxpayers, the LRA had the herculean task of realizing efficiency and effectiveness in tax administration. To realize this task such that the provision of public goods and services, and the distribution of income

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[27] Fallah, S. S. (2011) Public finance in Liberia: Re-starting from scratch. Development and Cooperation. https://www.dandc.eu/en/article/re-starting-liberias-tax-system-scratch

are met considerably, tax administration had to be drastically enhanced and automated. By digitizing the local tax administration systems, the government could broaden its tax base, increase domestic revenue, reduce the governments over reliance on foreign aid and natural resource revenue, reduce tax compliance related costs, and improve transparency and accountability.

13.2   Impact on tax administration and taxpayers

In 2005, immediately after the Country's fourteen years of civil unrest, tax administration was still being run as one of the many functions under the Ministry of Finance. During this time, Liberia had not eliminated physical human contact as far as revenue collection was concern and the system faced several challenges and limitations. This manual mode of tax administration, which was associated with weak administrative capacity, gave rise to high level of manual record keeping that correlated with a severe compliance cost. Revenue collection through this highly manual system of tax administration over time increased the tax collection gap negatively, as well as increasing gross levels of corruption and inefficiencies.

A benchmark study was conducted in 2016 in which Liberia's tax administration, including tax policies and processes, were benchmarked against international best practices to assess the level of effectiveness and reliability. The study identified major gaps and resultantly set up the stage for major tax reforms in Liberia. Some of the gaps identified included:

- The lack of an automated/ electronic filing and payment platforms.
- Limited avenues to make payments (i.e., mobile payments, etc.)
- Little to no tax payments through commercial banks.
- Non-existent tax-return processing centre and low data availability as a result.
- Lack of an automated compliance monitoring system.
- Limited role of the LRA call centre in promoting taxpayer education; and
- No regular taxpayer surveys.

The year 2009 represented a major milestone in the history of digitization of tax administration in Liberia. The Government initiated one of its first digital systems, the Automated System for Custom Data (ASYCUDA). In addition, the Standard Integrate Government Tax Administration System (SIGTAS) and the Tax Administrative System (TAS) were also adopted by the Government.

Liberia deployed the ASYCUDA system to its major customs ports covering approximately 85% of trade. Whilst the system conducts most of customs transactions, payments are yet to be made electronically. Before the introduction of ASYCUDA, all of Customs declarations were

manually handled through physical human interaction on a document called the Single Administrative Document (SAD), which during these periods facilitated the movement of goods from the port of entry to the payment of duties.

The entire process and the standard procedures associated with the declaration of goods at the time was manually conducted in Liberia, which was very convoluted and time consuming. In addition, it spread out sufficient room for collusion, which adversely impacted domestic revenue collection. As it is now, a lot of success stories are associated with the introduction of the ASYCUDA as well as challenges. The Department of Customs at the LRA can boast of a paperless transaction, that is, from the point at which the importers purchase their imports to a point where it is cleared at the various ports of entries in Liberia.

The LRA's administrative efficiency to collect import duties using ASYCUDA have improved tremendously. With the use of the ASYCUDA, Customs administration in Liberia is now able to:
   a. Track the movement of goods.
   b. Track the supply chain of goods.
   c. Conduct Time Release Study (TRS), that is, how long it takes to clear a container from our ports.
   d. Combat evasion.
   e. Conduct audit risk profiling on an automatic platform.
   f. Deal with voluminous importation.

The use of the ASYCUDA has also improved the processes of exemption (Tax Expenditures). That is, it takes at most 5 or less minute to complete an entire exemption documentation, a process that took up to two weeks to complete a single entry. The digital skills of the ASYCUDA conducts approximately 90% of Customs e-audits as it stands today at the LRA.
The Domestic Tax Department is the one of the core organs of the LRA. The Department is responsible for assessing, collecting, enforcing, and auditing all domestic taxes including property taxes. It collects 70% of Liberia's domestic revenue.

The Standard Integrate Government Tax Administration System (SIGTAS) and the Tax Administrative System (TAS) were legacy systems introduced by the Government of Liberia to improve the business process of the tax administration. However, due to the fact that these systems did not have e-tax capabilities, the LRA made a decision to discontinue their usage and procured a new tax administration system.

The Liberia Integrated Tax Administration System, (LITAS) is a tailored made tax administration system that was piloted in October 2022 and fully rolled out in February 2023. Major features of LITAS include:

a. Accessible using internet.
b. Mobile adaptable.
c. Online taxpayer registration.
d. Online filing.
e. Online payment.
f. Taxpayer access to tax accounts.

The LRA has also introduced other digital platforms in its digital journey to ensure that convenience is brought to the taxpayers in their dealings with the LRA.

a. Introduction of Electronic Fiscal Devices – October 2021. Cash machines are deployed to the premises of the taxpayers for the collection of sales data and the payment of sales tax.
b. Mobile money – March 2018. Use for the payment of taxes and other administrative fees.
c. Excise Tax Stamps – April 2022. It is a digital track and trace system that enables the LRA to monitor the production and importation of both alcoholic and non-alcoholic beverages.
d. Real Property Registration App. – March 2018. The App enables the mobile registration of real property.
e. Real Property Valuation App. February 2023. The App enables the mass valuation or appraisal of real property.

A major component of the Liberia Revenue Authority digitalization journey is the integration of LITAS into other digital platforms to ensure and increase the efficiency of tax administration. To date, the System has been integrated into the National Identification Registry and three commercial banks. Efforts are afoot to expend the coverage.

13.3   Lessons from Liberia's experience

Table 15: Lessons from Liberia's experience

Experience	Lesson
The Implementation of ASYCUDA	❖ Timely processing of declaration ❖ Significant reduction in collusion ❖ End to end paperless transaction with real time monitoring. ❖ Increase in Domestic Revenue

	❖ Improved efficiency in Custom Administration ➢ Classification Goods ➢ Country of Origin ➢ Time release study ➢ Track movement of Goods ➢ Track supply chain of Goods. ➢ Combat evasion. ➢ Automated risk profiling ➢ Dealing with voluminous Importation ❖ Track Duty Free
The Implementation of Standard Integrated Tax Administration System	❖ Increase Compliance and Efficiency in Tax Administration by automating Processes and Procedures ➢ Registration ➢ Filing ➢ Payment ➢ Arears Management ➢ Audit ➢ Return Processing ❖ Reduce Collusion
Implementation of Liberia Integrated Tax Administration System	❖ Reduce Compliance Cost on the part of Taxpayers by introducing Self-services. ➢ Online Portal to Tax Information ➢ Online Registration ➢ Online Filing ➢ Online Payment ❖ Improve data quality. ➢ All services are online allowing data entry to be done by the taxpayers. ➢ Integration with all Commercial Banks to allow for real time debit and credit into the tax accounts of taxpayer. ➢ Integration with Government Ministries, Agencies, and Commissions for push and pull of data to do analytics. ➢ Integration with Utilities Companies for intelligence gathering and data analytics.

Implementation of Electronic Fiscal Device	❖ The implementation allows for the deployment of electronic cash machine at the premises of taxpayers for the sole purpose of recording sale transactions and adequately reporting tax revenue. Some were integrated with existing solutions while others were stand alone. They all have the capabilities of recording, storing, and transmitting sales data in real time. ❖ It serves as a deterrence to undeclaration of sales revenue by taxpayer.
Mobile Money Implementation	❖ This targeted taxpayers without Bank Account but needed to make settlement of tax liabilities or payment of administrative fee.
Excise Stamp Implementation	❖ To combat smuggling ❖ To fight tax evasion through under declaration or production by taxpayers. ❖ To improve the certainty and predictability of tax revenue.
Real Property Registration and Valuation App	❖ Capturing, Registering, enumerating, and appraisal of real property. ❖ Increased Domestic Resource Mobilization.

14. JAMAICA - THE DIGITALIZATION OF TAX ADMINISTRATION

14.1 Background and technology

Tax Administration Jamaica (TAJ) accomplished the successful implementation of its Revenue Administration Information System (RAiS) project in December 2016. The primary emphasis of this initiative was on establishing an efficient tax system rooted in the principles of simplicity, transparency, maintaining revenue adequacy, and broadening the tax base.[28]

The RAiS implementation included three distinct phases:
Phase 1 – Consumption taxes (2015),
Phase 2 – Income tax and FATCA,
Phase 3 – Withholding and other income sources such as Stamp Duty, Betting and Gaming, and contractors' levy.

This substantial investment represents a customized Internet-based solution equipped with sophisticated risk models aligned with international best practices. The implementation also involved the reengineering of workflow management and the transformation of core business processes through the application of modern techniques in TAJ's operations. Particular emphasis was placed on the system's ability to facilitate a comprehensive range of predictive modelling and risk assessment capabilities, a crucial feature given the organization's challenge of handling a substantial volume of data from various sources. The system's capacity to assemble and utilize this data marks a significant improvement, offering insights into compliance risks that were virtually impossible to address in previous years. The foundation is now in place to provide a structured and direct path to the insights needed for informed decision-making.

The adoption of RAIS facilitated the establishment of an integrated end-to-end system encompassing all core tax activities and non-RAIS payments. Within RAIS, all processes are effectively managed, covering case selection and management, returns processing, assessment, reporting, debt management, and real-time monitoring of payment servers. The key modules include the following:
   a. Registration of taxpayers and customer access to eServices,
   b. Filing tax returns and paying all types of taxes,
   c. Compliance management, which identifies non-compliance and facilitates payment arrangements;

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[28] http://jota.website/index.php/JoTA/article/view/303

    d. Modules with auto-corrections and audit selection based on rules coded as well as predictive modelling tools.

    e. Managing the objection processes.

The implementation of RaiS was associated with the following challenges:

    a. Human factor (the need to hire the professionals and to find the right persons for the right jobs; managing the resistance to change; keeping on track with the project).

    b. Capacity building (training of the entire staff of the tax administration and the taxpayers to educate them how to use the new system).

    c. Legacy of the information systems (Finding the balance in maintaining system to provide services while the new system being developed).

    d. Funding (need for robust financing to acquire and customize the IT systems, refresh of technology and launch the promotional campaign).

14.2   Impact on tax administration and taxpayers

The implementation of RAiS has significantly influenced TAJ's strategy, leading to improved customer service standards and notable enhancements in compliance rates related to registrations, filing, payments, and accurate reporting. The analytical models embedded in RAiS have served as the foundation for crafting targeted strategies to encourage voluntary compliance, enabling TAJ to actively pursue tax avoiders and evaders through intelligence and enforcement actions. [29]

Since the implementation of RAiS, there has been a substantial reduction in the time taken by taxpayers to fulfil their tax obligations. The system's user-friendly features have facilitated smoother business operations and tax payments, evident from the increasing number of positive testimonials from taxpayers and a surge in the use of the electronic services platform. For instance, the financial year 2020/2021 witnessed a remarkable 3,353% increase in electronically processed payments, with the transaction amount soaring by 819% compared to the financial year 2014/2015 (pre-RAiS implementation). [30]

The successful outcomes since the implementation of RAiS have enabled TAJ to surpass its original collections targets, leading to the continued implementation of focused compliance strategies guided by this innovative technology. In general, the implementation of Rais is associated with the following benefits for Taxpayers:

    a. Streamlined processing time for both individual and business transactions.

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[29] http://jota.website/index.php/JoTA/article/view/303
[30] http://jota.website/index.php/JoTA/article/view/303

b. Access to online services for major tax types.

c. Real-time access to taxpayers' accounts.

d. Reduction in operating expenses.

e. Enhanced transparency.

f. More convenient way of conducting transactions.

For TAJ, the key benefits of digital transformation are the following:

a. Efficient assignment of work to team members,

b. Real-time monitoring of assigned work,

c. Quick access to information,

d. Timely reporting,

e. Reduced processing time,

f. Lower operational costs,

g. Increased revenue collection and achievement of revenue targets,

h. Enhancement in enforcement and other compliance actions.

14.3 Lessons from Jamaica's experience

Table 17: Lessons from Jamaica's experience

Experience	Lesson
TAJ experienced the lack of professionals who would be able to work with the new Information System.	The digital transformation policies and projects should foresee the capacity building to build the competences and skills necessary for working with digital tools. The change management strategies should be implemented.
Taxpayers often lack digital literacy and the knowledge on how to work with new information systems.	It is important to set up trainings to provide taxpayers with the basic digital knowledge and to educate them how to use electronic tax services. Tax administrations might consider establishing call-centres to help taxpayers and develop a FAQ page on the online tax portal.
Jamaica had to find the balance in maintaining the existing system to provide services while the new system was being developed.	Migrating from the legacy systems to new ones is a long process that often results in coexistence of the old and new systems. An agile approach to project management plays a crucial role in its transformation, particularly when there is limited documentation and

	knowledge about the new system. This approach fosters valuable behaviors and values, such as collaboration, continuous learning, and trust among policymakers, developers, and service providers.[31]
TAJ had limited resources to implement and promote the new information system.	Tax administrations should consider all types of costs associated with acquiring and customizing new technologies. A significant amount of expenses is not related to procurement and might arise due to promotion of the new technologies withing the tax agency and among the taxpayers. Developing countries cannot rely on own resources only and might consider obtaining mixed financing, e.g., from international organizations, and technical assistance.

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[31] https://www.sciencedirect.com/science/article/pii/S0740624X22001204