

DIGITALIZATION OF TAX ADMINISTRATION: A REVIEW OF THE ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD) GUIDELINES

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ABSTRACT

Tax administrations worldwide are being digitally transformed at a rapid pace. The increased capabilities of modern information technology to extract, process, and manage data is leading tax administrators to adopt new approaches in order to make taxation more efficient, effective, and transparent. This paper critically evaluates Tax Administration 3.0: The Digital Transformation of Tax Administration, a set of guidelines created by the Organisation for Economic Co-operation and Development (OECD). It reports on how leading countries have adopted each recommended building block in the OECD report, highlighting successes, challenges, and next steps on the road to digitalization for each country. The paper contains specific commentary related to Canada, which like the United States lags behind many other advanced economies in its implementation of the OECD recommendations. A detailed breakdown is performed pertaining to leading countries regarding the building blocks of Tax Administration 3.0, their journey towards its implementation, the challenges faced as well as the methods used to overcome them, and the next steps that will be taken towards further advancement. The OECD guidelines, although aspirational in nature, have been adopted and implemented by certain countries selectively, while others like Canada and the US lag. A key finding from this study is that no one country has yet been able to implement all the Tax Administration 3.0 guidelines.

JEL: M41, M42, O33

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INTRODUCTION

Tax digitalization is inevitable given the increasingly digital nature of modern economies and the services provide. The Organisation for Economic Co-operation and Development (OECD) has estimated that the future of tax services will increasingly be digitized, suggesting that structural changes to the way we compute, and even the way we think about tax, will change over the coming years (OECD, 2016). In 2020, the Forum of Tax Administration (FTA), a body of commissioners from tax administrations from OECD and G20 countries across the globe, published the OECD's findings on the future of the digitalized tax world, aptly titled *Tax Administration 3.0: The Digital Transformation of Tax Administration*, referred to herein as *Tax Administration 3.0*. *Tax Administration 3.0* is a set of aspirational guidelines put out by the OECD as recommendations for national tax administrations to follow. Since every

country operates in a unique tax environment, with differences in tax policies and approaches to tax administration between them, the OECD recognizes that a standardized approach with a mandated set of rules for all countries is not feasible (OECD 2020, page 8). This paper explores the guidelines contained within the *Tax Administration 3.0* report and draws out the recommendations that would most help countries meet the FTA's goal of ensuring fairness, competence, and efficiency in tax administration (FTA, 2021).

The OECD's report is split into four main sections. The first section explains how tax administration developed into its current state. A few leading countries on various areas have been highlighted in here. The second section evaluates this current state, while the following considers the merits of change versus stagnation. The report concludes by providing concrete recommendations for the future of tax administration. Throughout, the report highlights digital transformations and how technology has shaped, and continues to shape the evolution of tax administration.

Current tax administration has evolved from the previous setting of paper-based reporting to being more digitalized, which has since increased the competence of tax administration (OECD, 2020). The paper-based reporting model was inefficient, relied excessively on user-provided information, and was slow and costly (OECD, 2021). From the perspective of tax administrations, it was wasteful in terms of both the time and human labor involved in processing filing—resources that could have been allocated to other areas apart from monitoring compliance. *Tax Administration 2.0* introduced numerous elements in the advancement of digitalization, including faster and more reliable tax-paying services, systems for reporting, expansion of the ability to report using third parties, and heightened discovery of tax non-compliance (OECD, 2020). Consequently, the system contained numerous restrictions, including significant reliance on unforced disclosure and submission of taxes in addition to considerable costs and discipline required in understanding the nature of calculations and reporting of taxes, requiring substantial adjustments (OECD, 2020).

Today, most developed nations in the industrialized world have a significant digital tax infrastructure, with online services such as the automation of some tax structures and analytics programs that are increasingly competent at detecting errors and non-compliance. These countries are implementing these structures from the top to the bottom of their governments (Corydon et al., 2021). While the systems themselves are still mostly reliant on the user to provide and input information, some systems in development are designed to reduce the burden on taxpaying individuals and corporations, which is where the transition from *Tax Administration 2.0* to *3.0* truly begins. However, the Canadian taxation system is lagging in comparison to the world leaders in Digitalization, and an overhaul of systems, legislation, and information technology is required to catch up.

Tax Administration 3.0 is a suggested system and guidelines based on the underlying principle that tax administration should not have to rely on labour or information provided by taxpaying individuals or corporations to function. Instead, data inputted once at source should be utilized, and obtained automatically through various government systems that connect and share data amongst federal organizations within these developed nations. Although tax is not voluntary, the widespread use of the term “voluntary compliance” recognizes that, currently, taxpayers make choices with respect to the reporting, calculation, and payment of tax (OECD 2020, page 11). This is true for the Canadian tax system, for example: despite the system having some capability to automatically transfer certain income records (ex: employment and investment income earned through financial institutions), taxpayers are still required to enter information related to other sources of income, such as rental income and associated permitted deductions. This may lead to a tax gap which is the difference between how much tax a country should be collecting and how much tax is actually collected. Based on tax gap analysis, as measured in a number of countries that are part of the Forum on Tax Administration (FTA) that includes over fifty tax administrations across the globe, a reasonable estimate for the average tax gap across FTA members is probably in the range of 5% to 10% (OECD 2020, page 11).

Research indicates that Digitalization has helped generate some positive movement in closing the tax gap in many of these countries. According to the OECD (2019), the average e-filing rates for corporate income taxes have increased from about seventy-six percent in 2014 to nearly ninety-five percent in 2020. In addition, the use of technology for tax purposes has drastically increased since 2018. Only about twenty-two percent of administrations within the OECD do not currently use technology to assist with completing tax administration processes (OECD, 2019).

This paper builds on existing commentary on this matter by offering an in-depth view of the steps that countries have made towards transitioning to the *Tax Administration 3.0* system, and provides insights on what Canada – and the world – can do to incrementally improve the process of tax administration for taxpayers and administrators alike. Simultaneously, it also explores how countries that do not adopt *Tax Administration 3.0* standards will suffer in the long run. The paper begins with a literature review and provides background on the building blocks of *Tax Administration 3.0*. The section that follows outlines the methodology behind choosing the countries explored in this article. The subsequent two sections portray the results of countries that have led in implementing digitalization in tax administration, as well as the risks and considerations involved in their decisions to move forward with digital processes. Canada's performance in comparison is discussed later in the paper under "Results". The final two sections offer insight into a path forward, which includes a recommendation to encourage higher education institutions to implement courses that will enable students to develop the skill sets necessary to implement forward-looking recommendations such as those included in the *Tax Administration 3.0* guidelines, followed by a conclusion.

LITERATURE REVIEW AND BACKGROUND

Tax Administration 3.0, which is based on six core building blocks, encourages countries to develop and implement a new digital infrastructure to improve tax administration (OECD 2020). The key to successfully progressing along the digital spectrum is to integrate these core building blocks over time to achieve significant benefits of seamless tax administration by partnering with other parts of governments, with the private sector, and across borders (OECD 2020 page 42). The six building blocks that form part of *Tax Administration 3.0* are summarized and discussed below, followed by a discussion of methodology and results from countries that have successfully implemented elements of these core building blocks. Our research shows that the *Tax Administration 3.0* building block that has had the largest uptake to date has been "Taxpayer Touchpoints" (see Table 1), which all countries reviewed in this study have implemented.

Building Blocks of Tax Administration 3.0

i) Digital Identity

To integrate the key services provided to and key systems used by taxpayers, *Tax Administration 3.0* suggests that a "digital identity" for each taxpayer should be developed. This "digital identity" is in the form of a unique identification (i.e., tax identification number) that would allow the taxpayer to access fundamental services offered by the government and private sector organizations. To ensure taxpayer personal data is secure, a two-factor authentication should be required for entry into the platform. Further security measures should be in place for cross-border data transfers.

The goal outlined in this building block is to enable taxpayers to use their singular "digital identity" to access various administrative services. For instance, a taxpayer could use the same identity to access their personal tax data and tax information relating to their small business. Interaction between the different systems, both governmental and private sector systems, is key to ensuring a seamless experience for the taxpayer, and the central platform should update the taxpayer's data from each service in real-time.

There are a few factors that should be considered before the development of digital identities. An analysis should first be conducted on the benefits that taxpayers and the tax administration organizations will receive in addition to potential challenges that may arise in integrating this technology. It is also important for the “digital identity” to be developed collaboratively with governmental organizations, tax administrators, and key private sector organizations to ensure it is compatible with the services they provide. Services of higher priority should be identified first to ensure the benefits of integrating them are recognized by both the administrators and taxpayers. A leading nation with respect to the digital identity building block is Singapore, with its *SingPass* digital identity for individuals and *CorpPass* for corporations. Singapore’s digital identities are discussed further in the *Leading Countries* section of this paper.

ii) Taxpayer Touchpoints

Key to an effective and well-running tax administration system is interaction and engagement with the users of the system, the taxpayers. Therefore, touchpoints should be set up to allow for interaction between the tax administrators and taxpayers when there are issues relating to comprehension, special taxpayer circumstances, problems with a tax administration process, inefficiencies in tax processes, and for general tax-related inquiries. *Tax Administration 3.0* suggests that engagement with taxpayers can take place in the form of in-person interactions, phone conversations, web chats, and e-services through cross-functional websites and management systems. Efforts should also be made to decrease the burden on taxpayers by implementing systems such as “pay as you earn” (PAYE), which allow automatic transfer of tax data. Functions such as pre-filing or automated tax returns will also reduce taxpayer burden for individuals and businesses. Alternative channels of communication should also be available for taxpayers who are not able to access and use digital platforms to interact with tax administrators. Lastly, to enable a more seamless and efficient process, artificial intelligence tools should also be incorporated into taxpayer platforms to not only help taxpayers, but also to provide automatic assessment of taxpayer liabilities.

To fully realize this building block of *Tax Administration 3.0*, several functions must be developed and implemented. Taxpayers must have access to real-time support to ensure any problems are resolved rapidly. As common issues arise among taxpayers, the systems should be modified to allow for real-time resolution in ways that preclude future occurrences of the same issue. The system or administrators facilitating the touchpoints should be able to present analytical data to help taxpayers better understand the issue in addition to guidance on how to resolve the issue. Consideration should also be paid to how common issues can be eliminated over time by integrating specific services and touchpoints. Kenya is a leader regarding the implementation of the Taxpayer Touchpoints building block for digital tax payments, which is discussed in the *Leading Countries* section of this report.

iii) Data Management and Standards

The current tax administration’s focus in most countries is on the accessibility and standard of data. There is an emphasis on the quantity of data that can be obtained and the ways in which it will be stored, such as in a business’s own digital filing system, on a third-party website, or in the cloud. However, under *Tax Administration 3.0*, the focus shifts from data location and volume to the type of information that can be extracted and its accuracy. Under the Tax Admin 3.0 regime, the tax administration is increasingly managing the availability, quality and accuracy of data which will be drawn remotely from taxpayers’ wider natural systems (e.g. a corporation’s internal SAP system) as and when needed (OECD 2020).

The objective is to have taxpayers’ data integrated into central databases so that it is easily available to tax administration organizations. As for third party data collection, there is a shift towards the pre-filing of tax returns, which requires the development of high-level standards for data collection. By contrast, some national tax administrations, such as Brazil’s, are choosing to focus on more structured data collection methods, such as e-invoicing. Furthermore, with taxpayers’ data being electronically exchanged, privacy

assurance frameworks will need to be implemented and monitored. This will require that strong data security be integrated within data collection systems to avoid cyber-attacks, and that legal frameworks be implemented regarding data privacy and the exchange or use of the taxpayers' data.

To incorporate taxpayers' personal data into the central databases, there are a few factors that need to be taken into consideration. Elevated standards and legal requirements should be developed regarding data collection, its exchange, and assurance. For example, if a taxpayer has provided their data for social security reasons, there need to be clear legal restrictions and guidance on how that data can be used for the purposes of tax administration.

iv) Tax Rule Management and Application

The current process for “tax rule management and application” requires multiple steps and is time-consuming. It focuses on aspects such as using forms, paper or electronic, which make the taxpayer responsible for inputting appropriate and accurate information. In terms of communications with tax payers, there is an emphasis on tax law guidance in relation to deadlines and compliance, which is released through various mediums such as support chats and websites. However, with *Tax Administration 3.0*, technical tax rules and information will be integrated within the taxpayers' own systems (e.g. for businesses) to facilitate tax processing. For example, in *Tax Administration 3.0*, a business accounting system would incorporate tax laws into the system itself, alongside its computation and other functions.

The tax rules for various reporting systems and taxes will need to be published and distributed, which can then be integrated and tested within the taxpayers' own systems. However, the challenge most taxpayers face relates to the difficulty and costs associated with changing longstanding processes. Therefore, to realize the Tax Rule Management and Application building block, organization leaders will need to work closely with their IT departments to monitor their systems once the rules have been integrated. Further, systems will require either regular or intermittent updating as tax rules evolve. In addition, assurance for international guidelines will be needed regarding compliance with their tax rules and standards. Here, artificial intelligence (AI) could be helpful in answering questions and providing advice in how to update systems to comply with new rules.

v) New Skill Sets

To support the future digitalization of tax administration, it is crucial that preparations be made to support the new knowledge and abilities involved with automated platforms and technology (OECD, 2020). Since *Tax Administration 2.0*, where more digital systems were introduced, the abilities required to support customer-focused digital platforms have evolved. According to the OECD (2019), in 2017 most individuals involved in tax administration were engaged in auditing, customer assistance, or tax return remittance processes. Under *Tax Administration 3.0*, many of the tasks associated with these processes could be conducted primarily by AI. As a result, a new set of skills will be required by tax administrators and both individuals and employees than have been required in the past.

Organizations must take a variety of measures to implement *Tax Administration 3.0*'s “new skill sets” building block. Individuals involved with tax administration should expect, and be prepared for, changes in tax laws leading to changes in taxpayer behavior, and should be able to adapt to organizational changes and develop new digital-oriented skills when required (OECD, 2020). Finally, *Tax Administration 3.0* involves bringing together the knowledge of tax professionals to enhance data analytics and the development of e-services (OECD, 2020). The skills required will be more focussed on supporting the operation and evolution of the tax administration system as a whole. This will require an expansion in the number of IT professionals, programmers, data scientists, behavioural scientists and strategists (FTA, n.d.).

One country that leads in skill set development is Finland, which has developed COTS software to eliminate previous legacy systems and save in IT expenses each year. According to the OECD (2020), the primary purpose of the COTS system is to achieve excellence in online services for its customers while ensuring increased efficiency for personnel supervising the program, thus freeing up time for them to complete more important tasks. With the extensive increase in automation in their tax system, Finland has been able to process and examine data at aggressive rates, which will continue to cement its leadership in *Tax Administration 3.0* skills building in the future (OECD, 2020).

vi) Governance Frameworks

The final building block of *Tax Administration 3.0*, governance frameworks, recognizes that effective tax administration must take into account numerous global factors including technology, society, politics, and culture. With this broader perspective in mind, the aims of the governance frameworks building block involve making data collecting more convenient through secure and private networks, simplifying reporting for better tax compliance, and guaranteeing sanction controls (OECD, 2020).

To comply with *Tax Administration 3.0*, organizations following the “governance framework” building block should aim to achieve several key objectives. Most saliently, it is crucial to provide authority frameworks regarding the portrayal of tax administration that combines public and private districts at both the domestic and international levels to ensure tax compliance (OECD, 2020). Organizations must also consider, and agree upon, underlying concerns to face regarding collaborative practices in addition to outlining the efficacy of tax administration and the ability to adapt to changes where necessary while assuring the protection of data for all (OECD, 2020). To prevent cyber-attacks, a legal framework should be put in place to control the use of data to protect privacy, procedures for accountability should be established, and clear rules regarding the resolution of disputes and appeals should be set out.

Tax monitoring is central to the “governance framework” building block of *Tax Administration 3.0* in that it outlines the importance of voluntary participation from taxpayers while enforcing “digital identity” and e-invoicing. Russia is a leading country with a tax monitoring framework that has incorporated cooperative tax compliance with enhanced digitalization of documents and transactions in addition to the implementation of encryption keys to allow for the safe storage of accurate data (OECD, 2020). This has allowed the country to gain the trust of more taxpayers to strengthen the position of the Federal Taxation Service of Russia.

DATA AND METHODOLOGY

The approach undertaken for this study was to review nations for systems, mindsets, and other critical infrastructure that demonstrated a digitalized approach to taxation following the OECD *Tax Administration 3.0* guidelines. The countries profiled below were chosen because they have taken great strides towards improving tax administration in their jurisdictions relative to the OECD *Tax Administration 3.0* guidelines. They are Russia, Kenya, Brazil, Australia, and Singapore. Here, it should be noted that Kenya and Singapore are not members of the OECD, but are worth highlighting because of the significant digital tax administration advances they have implemented, which in many ways align with the building blocks outlined in *Tax Administration 3.0*. Further, the OECD itself has referenced them when discussing leading countries in terms of adopting and implementing the building blocks it provides (OECD 2020). In addition to summarizing the OECD findings on how countries are doing in terms of moving towards *Tax Administration 3.0*, the below section also highlights the next steps for countries to take to continue down this path.

RESULTS

A key observation that comes from reviewing countries leading in tax administration digitalization is that no one country has been able to accomplish all recommendations from *Tax Administration 3.0*. This is an expected result as *Tax Administration 3.0* is a collection of guidelines and “golden rules” that have been suggested for adoption by the OECD countries, not a systematic program designed to be implemented all at once.

Table 1: Progress by Country Towards Achieving *Tax Administration 3.0*, Divided by Building Block

Country	Digital Identity	Taxpayer Touchpoints	Data Management & Standards	Tax Rule Management & Application	New Skill Sets	Governance Frameworks
Russia	Progressing given the recent introduction to e-filing; however, lack of two-factor authentication to date	Progressing – digital copies of tax forms can be downloaded; however, digital payments for all types of transactions not yet introduced	Enhanced privacy and security of tax monitoring and e-filing	Lacks full compliance with international guidelines; however, progressing in that taxpayers are identified through financial institutions	Progressing-- new skill sets will emerge with more guidance surrounding performance management	Leading – Cooperative tax compliance through enhanced digitalization of documents and transactions
Kenya	Each taxpayer has their own Tax Identification Number (TIN); however, the country is emerging in this area as mobile devices have only recently started being used for digital identity	Leading – M-PESA provides taxpayers with real-time support for e-payments and e-transfers	Emerging – Data exchange has just been implemented using M-PESA, yet no security measures in place to date	Emerging –Taxpayers continue to register via the tax administration office, not financial institutions, to file tax returns	Progressing – Increased awareness of how technology impacts staffing with regards to tax administration, yet taxpayer behaviour under M-PESA not yet fully studied	Emerging –Tax inspectors review returns, but country is moving to automated assessment of returns through M-PESA
Brazil	Adoption of one billing model followed by all corporations, individuals, and taxpayers.	Progressing – The Brazilian Tax Management Support Program (PROFISCO) enabled corporations to digitize their accounting books and shift towards a fully electronic process regarding invoicing.	Leading – Focus on structured data collection such as e-invoicing and digitized accounting books.	Leading – Digitizing the invoicing process and accounting books for corporations lead to simplifying the administrative process allowing for higher tax collection and lower cost in relation to tax compliance.	Progressing – The Inter-American Development Bank (IDB) had to distribute funds to the Federal District and 22 states to provide training to the workforce regarding usage of the program. Furthermore, it helped them upgrade their technology to support the implementation of e-invoicing.	Leading – The Fiscal Management Commission (COGEF) was formed which included the Ministry of Economy, IDB, state representatives, and their federal revenue service. This was a means for consensus and unity to allow easier transition regarding the e-invoicing process.
Australia	Taxation systems have been digitized for taxpayer ease	Progressing – Less reliance on taxpayer-inputted data for streamlined reporting	Progressing – Australian payroll system has been automated for ease of use	Progressing – Automatic flagging of unusual reporting assists compliance	Progressing – Taxpayers have come to accept digital tax services	Progressing – Corporate benchmarks improve compliance records
Singapore	National digital identities have been developed for individuals (<i>SingPass</i>) and businesses (<i>CorpPass</i>).	Progressing – Government agency assists taxpayers through websites, webchats, virtual assistants, and call centers. Services such as auto-filing of tax returns is also available.	Leading – Taxpayer data and other government services are easily accessible through their <i>SingPass</i> or <i>CorpPass</i> portals.	Leading – Through the Inland Revenue Integrated System, simple tax returns can be assessed automatically, creating a more efficient tax filing process for individuals and corporations.	Leading – Taxpayers and staff were led and trained by the nation’s leaders in adopting new tax processes. With the digitalization of tax services, employees have been reallocated to complex tasks from administrative related work.	Leading – The federal government has piloted the tax digitalization projects, calling for more structured and digitalized processes.

A recent report published by the OECD stated that many of the elements of *Tax Administration 3.0* are on the aspirational end of the digital maturity spectrum (OECD 2022). Another critical aspect is that tax administrations operate in varied environments; therefore, the way in which they each administer their taxation system differs in respect to their policy and legislative environment, as well as their administrative practice and culture. As such, a standard tax administration approach across countries may neither be practical nor desirable (OECD 2020). Table 1 provides a summary of each of the building blocks of *Tax Administration 3.0* with the leading country for each building block.

Russia

Country Overview

With a population of over 144 million people as of 2020, the Russian Federation is one of the largest countries in the world. Its economy is enmeshed in a global system of exchange where it engages in both importing and exporting with numerous countries worldwide (The World Bank Group, 2022). Adapting to the evolving digital economy, Russia has noted its plans to expand digitally to uphold the needs and desires of its population in addition to the countries with which it trades.

The Federal Tax Service of Russia is the country's primary agency for tax reporting at the federal, regional, and municipal level. Its mandate includes working with individuals and businesses to facilitate their financial operations and enhance tax services. As of February 2022, the tax authority enabled the use of electronic filing, known as e-filing, for large taxpayers with the required software in addition to the implementation of further tax monitoring (Federal Tax Service of Russia, 2022).

Tax Monitoring & Electronic Filing (E-Filing) in Russia

Despite many of the current issues the country faces, Russia has proved to be a leader in the digitalization of tax administration through its implementation of tax monitoring techniques. Rather than creating a new idea to stretch across the Russia's full tax system, tax monitoring is an optional system that taxpayers may use in order to increase their compliance with tax authorities, thereby reducing tax fraud (OECD, 2020). The main idea of the system is to grant the Federal Tax Service of Russia access to taxpayers' reporting systems using application programming interfaces (APIs) to ensure secure digital tax reporting (OECD, 2020). The system focuses on allowing taxpayers to voluntarily digitally report taxes by providing the Federal Tax Service of Russia with the ability to monitor daily transactions to ensure quality and accuracy of data provided to the government (OECD, 2020). Based on findings from the OECD (OECD; 2020), voluntary participation in the system will result in a limited amount of source documents to be reviewed during a tax audit, thus reducing the time necessary for the audit, increasing turnaround of conflict resolution cases, and mitigating tax problems that could arise in future transactions. This would increase trust between taxpayers and tax authorities, reduce costs associated with tax reporting, and improve the reputation of the corporation through transparently reporting transactions that can be reviewed by the Federal Tax Service of Russia and other tax authorities (OECD, 2020).

Country Achievements – Tax Monitoring and Electronic Filing (E-filing)

While tax monitoring programs have been introduced in many countries, Russia was one of the first to implement them in 2015. There are many positives of implementing tax monitoring systems, including achieving reliable internal tax controls to reduce the amount of requested documents during an audit from the Federal Tax Service of Russia, should the agency have concerns (Lemetyuynen & Sergeeva, 2018). Tax monitoring also allows tax authorities to review a company's data in real, or near real, time, which in turn eliminates the need for formal audits and reduces or eliminates potential tax-related fines (Lemetyuynen & Sergeeva, 2018). It also allows companies to spend less on tax compliance, since the required

documentation is online for the tax authorities to access themselves. Increased tax compliance through tax monitoring contributes to the improvement of a company's reputation, as a positive working relationship between companies and tax authorities lowers the potential for certain risks associated with taxes (Lemetyuinen & Sergeeva, 2018).

There are several advantages to electronic filing for tax purposes. First, having the ability to complete filings electronically, such as by mobile phone or using the Internet on a computer, drastically reduces the amount of time required to submit transactions. According to the Federal Tax Service of Russia (2022), any transaction may be sent from a taxpayer office to the tax authorities at near real time and thus does not require a hard copy. As a result, the number of errors present during reporting is reduced since the software that is currently limited to specific taxpayers identifies tax and accounting errors to ensure compliance with the relevant standards to reduce human error (Federal Tax Service of Russia, 2022). The software also ensures confidentiality through enhanced security measures when filing online, including the use of encryption on data for added privacy measures (Federal Tax Service of Russia, 2022). Finally, human error is further reduced by software's ability to automatically check all system inputs, allowing for increased efficiency associated with increased accuracy (Federal Tax Service of Russia, 2022).

Next Steps

According to the OECD (2020), with new challenges associated with the world's increasingly digital economy come new tools required to support the tax system during this evolution. Going forward, some of the innovative technology to be implemented by the Federal Tax Service of Russia include the following (OECD, 2020): Digital identity (DI); Block chain; Cloud technologies; Big Data; Artificial Intelligence (AI); Robotic Process Automation (RPA); and the Internet of Things (IoT).

At the moment, digital identity appears to be the priority of the Russian Federation over the next few years, which involves using cryptocurrency and other aspects of crypto to enhance the security of system authentication, improving legal frameworks and electronic signatures, and enhancing information technology (IT) systems (OECD, 2020). Through these measures, Russia aims to build trust between taxpayers and tax authorities to encourage voluntary compliance with taxation policies. As of February 2022, the Federal Tax Service of Russia has made certain taxpayers eligible to e-file directly to the tax authorities such that they obtain the necessary software that has not been released to the public to date (Federal Tax Service of Russia, 2022). With the most recent introduction of its e-filing system, the country is well situated to implement a digital identity program with the aid of artificial intelligence (AI) and the Internet of Things (IoT).

Observations – Tax Administration 3.0

Overall, it is evident that Russia is a leader in tax administration through the implementation of e-filing for tax purposes and tax monitoring to enhance cooperative compliance. Though under harsh economic sanctions at the moment stemming from its invasion of Ukraine, Russia would generally be considered a leader in terms of Tax Administration 3.0's sixth building block involving "Governance Frameworks," given that its tax administration is governed by politics, society, and technological factors (OECD, 2020). In addition, the governance provided by Russia's tax authorities includes the goal of obtaining high compliance regarding taxes whilst minimizing tax fraud using secure, accessible data (OECD, 2020). This area of focus allows taxpayers to be reassured when it comes to reporting taxes, which enforces transparency through its compliance, touching on the "Digital Identity," "Tax Rules," and "Taxpayer Touchpoints" building blocks of *Tax Administration 3.0* (OECD, 2020). Through the enhanced privacy and security of tax monitoring and e-filing within the country the "Data Management" building block also ties to the possibility of expansion to "New Skill Sets" (OECD, 2020). By introducing tax monitoring and e-filing systems to comply with *Tax Administration 3.0*, the Russian Federation is well on its way to becoming

a leader in tax administration, a status it can further solidify by implementing cloud technologies and digital identity (DI) with the use of AI.

Kenya

Country Overview – Digitalization and M-PESA

Since 2007, Kenya has distinguished itself among sub-Saharan African countries with regards to its digital economy, specifically in mobile banking. In 2007, Safaricom, the country's dominant mobile network provider, announced the release of a new program to assist individuals in transferring money using their own mobile devices, known as M-PESA (Mbele, 2016). By 2013, Safaricom had noticed a drastic increase in the usage of M-PESA that the Kenya Revenue Authority (KRA) broadened the capacity of the program to allow taxpayers to make online tax payments from any mobile device within the country (OECD, 2020).

Challenges Faced by Kenya

Prior to 2013, taxpayers were forced to go to their bank or physically attend a meeting at a KRA office to make payments relating to their annual taxes (KRA, 2019). This was problematic, as there was a low level of service delivery to taxpayers, leading to low customer satisfaction and compliance, which in turn increased the risk of fraud.

The primary purpose of the expansion of M-PESA to include the ability to pay taxes through mobile devices was to target individuals without bank accounts, indicating that the technical aspect required adjustments to satisfy the demands of these specific customers (IFC, n.d.) As a result, Safaricom and its parent company, Vodafone Group, were faced with the issue of sustainability, since most of the platforms available for purchase during the implementation phase of M-PESA were created for advanced economies. The company therefore decided to create its own service despite the cost and additional time required (IFC, n.d.). Despite the initial expenses, designing its own platform was the best idea, since the platform they arrived at featured a special layout that enabled the platform to target specific, less well-off customers. This was a big factor in the success of M-PESA in collecting taxes and tax information (IFC, n.d.)

Another significant challenge the country faced in implementing M-PESA included obtaining trust from its taxpayers regarding the use and location of their money. The International Finance Corporation (n.d.) outlined those agents within Kenya that were servicing M-PESA and were regularly accused of committing fraud because of absent or postponed tax receipts. Overall, just over 4% of individuals have claimed to have had their funds transferred incorrectly (IFC, n.d.). Today, M-PESA is widely popular and experiences very few challenges related to trust, which were common in tax administration prior to the platform's implementation.

Achievements – M-PESA

Kenya has achieved numerous tax administration successes since Safaricom implemented the M-PESA platform. Prior to the introduction of M-PESA, the country was prepared for the introduction of modern technology, given that most of the population 15 years of age and older had access to cell phones and other mobile technology (IFC, n.d.). As a result, much of the population was familiar with the use of mobile technology, including how to send text messages and make phone calls (IFC, n.d.). This allowed for a smooth transition for most of the population with regards to the introduction of the M-PESA platform since text messaging was required in order to transfer funds.

Upon development by Vodafone Group, M-PESA was known as the first service for transferring money online in Kenya (IFC, n.d.). According to the International Finance Corporation (n.d.), with an increasing

desire to reduce dependency on cash to enhance security whilst decreasing the time it takes customer money to be transferred, a high demand for new tax services existed. Previously, due to a relative lack of vehicles in Kenya, individuals were required to trust family members or strangers with their money for it to be transferred in certain villages (IFC, n.d.). With no significant market competitors at the time, Safaricom was able to seize the digital money transfer and tax payment market

How Did Kenya Do It?

Before the development of the M-PESA platform, a strong initial emphasis was placed on understanding the needs and desires of the people of Kenya rather than marketing the platform (IFC, n.d.). Safaricom identified the platform's biggest strength as the convenience through which people could send money through a mobile device, thus limiting the need to carry cash on hand.

An M-PESA pilot program began in October of 2005 that allowed for the opening of multiple stores and included over 500 participants within 3 domestic locations of Kenya, the primary purpose of which was to gain trust between agents and customers for completing transactions, specifically when it came to withdrawing funds since the instructions were sent via text message.

Training proved to be a significant limitation on Safaricom's decision to launch M-PESA in the initial stages of the pilot program since agents were required to understand virtually all areas of the M-PESA platform to help customers with questions or technical concerns (IFC, n.d.). To counter this, numerous resources were provided weekly in addition to constant training on the operation of the platform to uphold a strong understanding of the system to ensure complete satisfaction for customers. As a result, trust between customers and agents drastically increased which led to millions of Kenya shillings transferred using the new platform, encouraging Vodafone Group and Safaricom to launch the platform sooner rather than later.

Next Steps

After the success of M-PESA, as of August 1, 2021, the Kenya Revenue Authority adopted electronic tax invoices (KRA, 2021). All taxpayers that are registered for value-added taxes (VAT) are required to comply with these requirements within twelve months of the adoption date (KRA, 2021). The new system, known as the Tax Invoice Management System (TIMS), is said to be an improved version of the Electronic Tax Register (ETR) system that was originally implemented in 2005, which will make the management of electronic tax invoices easier to deal with, primarily through delivery to the KRA in real-time (KRA, 2021). In addition, the Kenya Revenue Authority (2021) emphasizes that complying with the new system will allow for pre-filled VAT returns, which will simplify the process of filing and ensure a quicker movement of refunds relating to VAT for customers on top of automatically activating the Electronic Tax Register. The success of the TIMS system will be illustrated through increased VAT compliance, measured in part through reduced fraud and a general rise in tax revenue.

Though AI uptake remains limited in Kenya's digital economy, Bayhack (2022) emphasizes the potential for mobile banking in Kenya to continue to advance contactless payments, registration using online portals, and social aspects relating to tax administration. Allen and Okpali (2022) suggest that Africa has already started thinking about AI through technologies such as surveillance and drones, and in analytic platforms like the EarthRanger conservation program used in Kenya. In addition, Strathmore University (2019) in Kenya indicates that AI may be tailored to services surrounding health, transportation, education, public services, food development, and individuals with disabilities in the future. With regards to healthcare, an AI solution such as the Sophie Bot, created by a start-up company in Kenya that allows for individuals to discuss questions and concerns regarding sexual and reproductive health with a chatbot free of charge, is crucial in maintaining a strong connection between individuals and government organizations (Strathmore

University, 2019). Although this service is used for healthcare, it may one day be expanded to tax administration within Kenya, to assist users of M-PESA and other competing tax payment services by simplifying the tax reporting process to enhance tax compliance. Given that transactions completed using M-PESA increased by 45% from the first quarter of the COVID-19 pandemic lockdowns in comparison to the previous year, there is a high probability of the implementation of AI into the platform, or emerging mobile tax platforms, in the near future (Seal, 2021).

Observations – Tax Administration 3.0

Overall, Kenya is considered advanced with regards to automation of tax services given its M-PESA platform and the forthcoming implementation of electronic tax invoices. To date, the country acquires \$1.1 million USD monthly in tax revenues from mobile banking alone (OECD, 2020). Between fiscal years 2019 and 2020, the OECD (2020) noted a 95% increase in mobile tax payments, which is expected to continue to rise in the future. Also according to the OECD (2020), the M-PESA platform controls 98% of Kenya’s digital money transfer market: it had over 58 million subscribers in 2019 despite the country’s population being approximately 46 million people.

The popularity of the M-PESA platform for transferring money and paying taxes shows Kenya to be a leader in terms of implementing tenets of *Tax Administration 3.0*. Specifically, the country ranks high in the OECD’s “Taxpayer Touchpoints” building block, since M-PESA offers real-time support while providing accurate analytical data in addition to allowing for integration to assist with taxpayer needs (OECD, 2020). Moreover, the platform allows for numerous services to be performed, including e-payments and e-transfers, and the program assists those who are not used to the option of online payment and transfers; this feature conforms with the accessibility strategy outlined under “Taxpayer Touchpoints” (OECD, 2020). In addition to this, Kenya’s M-PESA platform revolves around the use of access controls and authorization, tax filing and payments, the Tax Authority of Kenya on top of its major banks, and numerous software developers that enhance the technology. As a result, Kenya also finds itself leading under the “Digital Identity,” “Data Management,” “New Skill Sets,” and “Governance Frameworks” building blocks outlined under OECD *Tax Administration 3.0*. By introducing the electronic tax invoice system in 2021, Kenya continues to evolve regarding tax automation and will continue to do so through incorporating AI in its tax administration in the future.

Brazil

Country Overview – Digitalization and The Brazilian Tax Management Support Program (PROFISCO)

In the past 14 years, Brazil has made leaps regarding the Digitalization of invoices. As a nation, it has shifted from traditional methods of invoicing towards a fully electronic process, becoming a market leader in e-invoicing in South America (Koch, 2021). The process of investing in e-invoicing began in 2008 because of Brazil’s need to increase funds to provide better public services without burdening citizens with new taxes (Aragaki, n.d.). Additionally, companies were finding it costly to pay their taxes, and the Brazilian government was facing difficulty ensuring tax compliance (Aragaki, n.d.). Brazil started the process of digitizing its invoicing with the technical advice and financing of the Inter-American Development Bank (IDB), leading to the creation of the Brazilian Tax Revenue Management and Integration Support Program (PROFISCO). As stated in the loan proposal by the IDB, the PROFISCO program’s purpose was to streamline and allow transparency regarding fiscal management to boost the state’s revenue, strengthen oversight of public spending, and provide better public services.

Challenges Faced by Brazil

Brazil had to overcome multiple challenges to transition to Digitalization including digital invoicing. Their major obstacle was obtaining consensus among the central government and 27 federate entities regarding the adoption of a single billing model (Aragaki, n.d.). To address this challenge, the Fiscal Management Commission (COGEF) was established. This body included the Ministry of Economy, the IDB, state representatives, and the federal revenue service (Aragaki, n.d.). Digitalization. Furthermore, Brazilian policymakers recognized that many organizations and employees would lack technological proficiency to properly implement PROFISCO. To overcome this challenge, IDB distributed approximately US \$586.2 million to the Federal District and 22 states (Aragaki, n.d.) for workforce training on how to use the program and to help them upgrade their technology to support it.

Achievements - PROFISCO

PROFISCO played a key role in Brazil's digital transformation as it enabled the government to automatize its administrative legislation which also led to all tax dispute procedures being executed electronically (Azevedo et al., 2021). Alongside e-invoicing, PROFISCO also enabled corporations to digitize their accounting books (Aragaki, n.d.). As a result of implementing PROFISCO, the Brazilian government can now access a corporation's books and confirm that the tax paid matches the invoicing throughout the tax period (Aragaki, n.d.). The implementation of PROFISCO has resulted in the simplification of administrative processes, a rise in the collection of tax, and lower tax compliance costs for both companies and government (Aragaki, n.d.).

How Did Brazil Do It?

PROFISCO had four major elements including "integrated strategic management, tax administration and litigation, financial and property management and internal control, and management of strategic resources" (IADB, n.d.). Integrated strategic management involved upgrading current practices and technology to aid strategic management alongside gathering data to support decision-making. Tax administration and litigation focused on increasing Brazil's collection of revenue by improving the tax administration's performance. Financial and property management and internal control involved strengthening the control of public spending by enhancing economic management performance. The management of strategic resources focused on developing and enhancing support methods along with tools and systems to improve "institutional performance and interaction with society" (IADB, n.d.).

Next Steps – PROFISCO II

Brazil is in the process of implementing PROFISCO 2. Its objective is to provide the State of Amapá with financial sustainability (IADB, n.d.).

Observations – Tax Administration 3.0

Based on our research, it is evident that Brazil is a leader in e-invoicing. Despite the lack of technology and trained workforce, Brazil has built a digitized system that allows transparency regarding tax compliance and creates ease of use for its government, businesses, and citizens. In this sense, Brazil is taking concrete steps towards achieving *Tax Administration 3.0* by implementing the building blocks of "Taxpayer Touchpoints" as well as "Data Management and Standards." While Brazil has had to overcome challenges by updating its technology and investing in its workforce, it has in many ways outpaced more developed countries in digitizing tax administration. To developed countries, Brazil provides a model for how to overcome the obstacle of obtaining consensus regarding one billing model: establish a centralized committee with wide representation to bring multiple perspectives to the table and enhance the chances of

cooperation from all parties. Once there is agreement among all parties, the transition towards Digitalization will be much smoother for developed countries in comparison to developing countries considering the greater amount of resources available.

Australia

Country Overview

Australia is among the more digitally advanced nations of those explored in this paper. It has adopted key policies and technologies for every pillar of the OECD *Tax Administration 3.0*. These include a superb Single-Touch Payer (STP) payroll system, a well-developed benchmarking system for corporate compliance, and the automation of many compliance activities. While there are still significant hurdles to clear before Australia reaches compliance with all *Tax Administration 3.0* guidelines, Australia should be looked at as one of the early adopters of the suggestions put forward by the OECD.

Achievements

Australia's taxation system has evolved in recent years to increasingly rely on big data. The government has shown a willingness to legislate policies that favor the integration of the OECD's recommendations on Digitalization, and it is this willingness that has led to its Single Touch Payroll system (Australian Tax Office, 2021). With the stated goal of reducing the burden on employers by integrating most taxation information that was previously done by employers into the payroll tax software, the new system has digitized all relevant data, and thereby reduced the risk of accidental non-compliance or compliance mistakes significantly.

With the aim of reducing non-compliance, Australia has also developed a system to help its 1.7 million taxpaying business check their reporting against benchmarks set out by the government (Australian Tax Office, 2020). The system works via an application wherein taxpayers can enter their reporting information and check to confirm that they fall within the benchmarks. If they do not, they are encouraged to confirm so that their figures are accurate before submitting, as being outside the benchmarks makes their return significantly more likely to be flagged for review by the system.

How Did Australia Do It?

Australia, like most developed countries, has extensive existing taxation infrastructure, such as legacy structures and codes, that risk impeding digital progress (Hirshhorn, 2021). These structures and codes make sweeping overhauls to the tax systems difficult. Australia has therefore gradually begun moving away from a taxpayer reliant system in ways that are not likely to cause significant disruption towards automated processes that leave less room for human error (Hirschhorn, 2021). Australia has begun to think of user data in an abstract sense, in that the higher quality of the data inputs, the higher the likelihood of compliance to the tax code. It has separated data as an idea into six levels, with Level 1 being the weakest data, and Level 6 being data so precise and accurate that the system can use it with little to no input from the filer. Current systems, such as that found in Canada's existing tax infrastructure, are heavy on 'Level 1', or weak taxpayer-provided datasets that are difficult to verify and do not help reduce non-compliance. Recent developments in these sorts of systems involve some implementation of, at best, Level 4 data, such as Canada's Auto Fill My Return (AFR) (Government of Canada, 2019). While this system is a good start, its current focus is on individual taxpayers with significantly less development on the corporate side. The ideal system makes use of the highest quality datasets to improve outputs (Hirshhorn, 2021), which Australia has been working to do. The Australian legislature has recognized what the OECD has recommended for over a half-decade: that digitizing the taxation system is crucial to improving the efficiency of tax delivery in the internet era (OECD, 2015).

Governments must recognize that to meet the OECD's *Tax Administration 3.0* standard, some things are going to have to change from both a legislative and a systems perspective (Corydon et al., 2021). Per Corydon et al. (2021), to meet the high standard set out for a digitized nation, four elements must be present: services, processes, decisions, and data sharing all must be addressed to go fully digital. Services and processes go hand in hand, with automatic data input processing simplifying the process of completing the tax return itself. Changing processes means that services ought to be changing, which often requires both information technology overhauls and government support, neither of which is easy to accomplish without a concerted effort. Data sharing is likewise difficult to accomplish with multiple agencies involved in various elements of financial and taxation matters (in most developed countries, at least). But it is important, as interagency data sharing reduces inefficiencies at a fundamental level (OECD, 2015).

Next Steps

Australia has committed to furthering the Single Touch system, with plans to expand the STP programme to other areas of tax by end of 2022 (Australian Tax Office, 2020). The benchmarking process that Australia has laid out is sure to be refined and fine-tuned to maximize tax compliance by Australian corporations as the Australian Tax Office continues to try to implement the OECD guidelines that it has chosen to focus on. Expectations are that the overhauls to the tax system as noted by Mr. Hirshhorn (2021) are likely to continue, with further Digitalization and automation of systems, services, and software on the horizon.

Observations – Tax Administration 3.0

Australia's focus on reducing the burden on taxpaying corporations, and their visionary benchmarking system, are elements of taxation that are likely to be mimicked by many other OECD countries in the coming years as more nations aim to comply with the *Tax Administration 3.0* guidelines. Australia is one of the countries that has most effectively implemented the building blocks of both "Data Management" and "Taxpayer Touchpoints" in particular. The expectation is that the taxation authorities in Australia intend to further optimize the system with less taxpayer input from corporate entities themselves, to create a digital identity for enterprises.

Singapore

Country Overview – Inland Revenue Authority of Singapore (IRAS)

A leader in the global Digital Revolution, Singapore aims to leverage Digitalization and technology in its economy and government to become a high-tech-driven nation, what its government refers to as a Smart Nation (Smart Nation, 2022). The Singapore Digital Government pillar seeks to serve its citizens, businesses, and public officers by developing efficient, resilient, and protected digital services based on citizens and business needs. By providing reliable and convenient digital systems, Singapore aims to enable its citizens to utilize digital services confidently. In 2020, 94% of the services offered by the government of Singapore could be accessed and completed digitally. This percentage is expected to rise to 100% by 2023 (Smart Nation, 2022).

The Inland Revenue Authority of Singapore (IRAS) is a government agency created to address high outstanding amounts of tax revenue each year, high staff turnover, and overall public dissatisfaction (Bird & Oldman, 2000). The establishment of the IRAS has yielded countless benefits to the Government of Singapore, including lower tax arrears, improved audit functions, up-to-date property evaluations, lower staff turnover, and a notable increase in public satisfaction with tax administration. All these goals were achieved without increasing the size of the government's labour force (Bird & Oldman, 2000). A survey in 2000 revealed the satisfaction rate with IRAS services for individual taxpayers and corporate taxpayers was 95% and 83%, respectively (Bird & Oldman, 2000).

The IRAS developed an integrated tax database system, the Inland Revenue Integrated System (IRIS), to convert hard copy documents into a virtual imaging system. This digital imaging system enables tax documents to be accessed immediately through network terminals (Teo & Wong, 2005; Bird & Oldman, 2000). As of 2005, this has allowed for the automatic assessment of around 80% of simple returns (Teo & Wong, 2005). The efficient assessment process provides taxpayers with timely confirmation of their tax payments, and wither what they continue to owe or can expect as a refund. It has enabled the IRAS to send assessments and collect tax revenue faster than before. The IRIS, therefore, can serve as a useful model for implementing other digital government initiatives (Teo & Wong, 2005).

In addition to IRIS, Singapore has implemented several systems related to the Digitalization of tax administration, including e-filing, e-payments, and *SingPass* and *CorpPass* for national digital identities.

Challenges Faced by Singapore

One of the most significant challenges faced by the IRAS was convincing taxpayers to e-file their returns. Since a faster assessment meant a faster deadline to pay taxes, there was low motivation from taxpayers to e-file (Teo & Wong, 2005). Security was another major concern for the IRAS, given the large volume of transactions and sensitive nature of the data (Teo & Wong, 2005). How Singapore mitigated both these challenges is discussed in a subsequent section.

Achievements - E-Filing

E-filing is one of the 1,600 digital public services provided by the IRAS. With an e-filing system, taxpayers can file their income tax returns using the internet or a telephone (Teo & Wong, 2005). By integrating all systems at the government level, employers can supply taxpayer information directly to the IRAS (Bird & Oldman, 2000). In addition, IRAS has also integrated data with the Central Depository (which pays out dividends from Singapore's public companies), allowing for access to dividend income for taxpayers from Singapore's publicly listed companies (Bird & Oldman, 2000). The integration with employers and the Central Depository has allowed the IRAS to automate the reporting of employment and dividend income. The IRAS can also obtain tax data for charitable donations directly from charities (Teo & Wong, 2005). If these are the main sources of income and deductions for taxpayers, the taxpayer can file their returns in just twelve clicks. This 12-click feature, introduced in 2004 by the IRAS, enables taxpayers to file, print, and save any documents from the IRAS relating to their tax return with minimal effort (Teo & Wong, 2005). The feature is convenient for taxpayers as it has low levels of data entry and allows for mobile e-filing and re-filing if errors are made (Basu, 2002, 2003). Through continuous integration with government systems, tax returns from 98% of individuals are e-filed (OECD, 2020). This has not only increased convenience and taxpayer satisfaction, but it has also improved tax compliance, as data in tax returns are automatically entered from the source (Bird & Oldman, 2000).

Taxpayers can also file their returns through IRAS' phone-filing systems (Bird & Oldman, 2000). This capacity addresses accessibility issues. IRIS also has an automated phone line that is available 24-hours and enables taxpayers to obtain general information on taxes and specific information for themselves through their personal identification number (Teo & Wong, 2005). The challenge with using a telephone for e-filing is that due to its nature, the system can cause discomfort for taxpayers who want visual confirmation of their transactions (Teo & Wong, 2005).

When it began to implement e-filing, the IRAS had two main objectives: to achieve operational effectiveness and to improve services provided to customers (Teo & Wong, 2005). Manual filing and assessment of tax returns required both more staff labour and delayed tax revenue collection. With e-filing, the IRAS has been able to achieve operational effectiveness with lower transcribing errors and higher accuracy as taxpayer information is automatically sent from employers to the IRAS (Teo & Wong, 2005).

Manual filing has an error rate of 18% compared to the e-filing error rate of 1% (Teo & Wong, 2005). E-filing also reduces the burden for taxpayers as their employment income details are automatically inputted. As the key users, IRAS places great emphasis on the quality of services offered to the nation's citizens and taxpayers (Teo & Wong, 2005). Reflecting this commitment, the IRAS and hosted annual focus group sessions with taxpayers to obtain user feedback, and incorporated this feedback when revamping their tax administration process (Teo & Wong, 2005).

The cost to develop and maintain Singapore's e-filing system for three years was US\$ 6.84 million (Teo & Wong, 2005). Although this is a high figure, with less labour required, less time screening tax returns, less time spent on data entry, and overall less time and effort spent on records management, mailing, and posting, the IRAS has seen a substantial cost saving since it moved to e-filing (Teo & Wong, 2005). Indeed, the implementation of e-filing has allowed Singapore to save US\$ 4.93 for each tax form. As more taxpayers utilize e-filing, maintenance costs will further decrease and the e-filing systems will contribute to additional cost savings (Teo & Wong, 2005).

Achievements - Digital Identities

To enable citizens to perform digital transactions with the Government of Singapore and organizations in the private sector, Singapore developed national digital identities for individuals (*SingPass*) and for corporations (*CorpPass*) (OECD, n.d.). For convenience, SingPass can be accessed via mobile devices through biometric authentication, creating a quick and secure login experience (OECD, n.d.) Through the mobile application or website, SingPass users can access services offered by the government such as child support forms and paying property tax, or access services from private sector companies, such as purchasing insurance and filing claims (OECD, n.d.).

Importantly, the Myinfo portal in SingPass and CorpPass can share personal or corporate data with public or private agencies when requested (OECD, n.d.). For instance, individuals or corporations can apply for a credit card or a line of credit directly through their SingPass/CorpPass profile using the Myinfo feature, as all relevant data is already securely stored in the system. SingPass/CorpPass are also conveniently integrated with the IRAS. Citizens can access their *myTaxPortal* portal directly through their SingPass/CorpPass account to review tax returns and make tax payments (OECD, n.d.).

How Did Singapore Do It?

One of the key factors behind Singapore's success has been dedicated leadership and support for digital innovation by political leaders (Bird & Oldman, 2000; Teo & Wong, 2005). Singapore was a leader in the global digital revolution and trained staff to ensure they can carry out their responsibilities (Bird & Oldman, 2000; Teo & Wong, 2005). Rather than making incremental technological improvements to its existing tax administration systems, Singapore revamped all components of their systems with new, re-engineered technology (Bird & Oldman, 2000).

Singapore outsourced the development of their e-filing platform and database server hosting and management to the National Computer System (NCS) (Teo & Wong, 2005). In addition to web servers, the IRAS also maintains additional copies of taxpayer data at an independent registrar, CISCO (Teo & Wong, 2005). Taxpayer authentication is required for entry into the system and the data is encrypted from end to end. To provide additional support, the IRAS has hosted user support hotlines with employees from all departments on hand to help customers during tax filing months (Teo & Wong, 2005).

The new digitalized systems and services were thoroughly planned and released in stages to taxpayers. Each taxpayer service was carefully, and continuously monitored, and extensive feedback was taken from users on an ongoing basis (Bird & Oldman, 2000). The next question is how Singapore got its citizens on board

with e-filing. The first step to change this was to educate taxpayers and employers. Singapore did this through the distribution of brochures outlining all details and steps relating to e-filing, answering taxpayer questions through helplines, allowing taxpayers to experience what e-filing is like by establishing demonstration booths, and hiring volunteers to answer taxpayer questions at community clubs (Teo & Wong, 2005). The IRAS also utilized television and magazines to educate taxpayers on the benefits of and provide tips on e-filing. To ensure that taxpayers are not held back from e-filing due to lack of access to technology, the IRAS also supplied community clubs with computers (Teo & Wong, 2005). Lastly, to incentivize e-filing, the IRAS developed lucky draws for taxpayers that used and/or assisted others with e-filing their returns (Teo & Wong, 2005). These steps were crucial to the success of the e-filing systems as educating taxpayers and providing them with the required support and assurance ensured they could not use only the system but also felt comfortable using it. A significant reason for Singapore's success in piloting such drastic changes to their tax administration systems was the trust they built and developed with their citizens (Bird & Oldman, 2000).

Bird and Oldman (2000) suggest that although Singapore was able to completely restructure its systems, other nations may first have to fix their current tax structures before they can implement modern technology. Teo and Wong (2005) also discuss that Singapore's e-filing experience would be more applicable to nations with a well-established IT infrastructure and a citizenry with high IT literacy. Therefore, before complex information technology can be incorporated into their systems, countries should first establish tax identification numbers for their taxpayers to make the most use of the technology (Bird & Oldman, 2000).

Observations – Tax Administration 3.0

Nations can learn from how Singapore educated its citizens, obtained their trust, and got them on board with digitalization, specifically e-filing. Singapore has effectively implemented several systems enabling it to become a Smart Nation. Through tax administration digitalization initiatives taken at the government level, Singapore has met the “Governance Frameworks” building block outlined in *Tax Administration 3.0*. Singapore's SingPass and CorpPass systems enable taxpayers to access key government and private sector services through one unique identification number, enabling Singapore to meet the “Digital Identity” framework in *Tax Administration 3.0*. Singapore also offers various “Taxpayer Touchpoints” as discussed in *Tax Administration 3.0*, such as support offered through the integrated IRAS website, webchats, call centres, and a virtual assistant on the SingPass and CorpPass websites.

Canada's Performance

Canada has developed and implemented tax systems that reflect the Digitalization of the modern world, such as the Autofill function in Canadian tax software and electronic filing for many returns. It has divested from paper in most cases, with a few notable outliers such as the delivery of paper tax slips. In these ways, Canada has met the criterion for *Tax Administration 2.0*. The country struggles, however, with the existing infrastructure of the current tax code, which is the case for many developed countries, and Canada is no exception. Indeed, developing nations are more likely to successfully implement *Tax Administration 3.0* policies in accordance with the OECD guidelines precisely because they can implement 3.0 systems from scratch rather than having to adapt existing systems (Corydon et al., 2021).

Canada faces similar challenges to many developed nations with regards to its legacy system, wherein compliance is not built into existing taxation. The current Canadian system relies heavily on voluntary compliance, whereas the ideal *Tax Administration 3.0* system relies on benchmarks, high-quality data, and simplified or automatic compliance, with few chances for corporate or personal taxpayers to be non-compliant (Hirshhorn, 2021). In fact, though Canada's existing system does have some risk assessment elements (Government of Canada, 2019), it still relies heavily on post-assessment audits. A key aspect of

Tax Administration 3.0, by contrast, is that the system automatically detects non-compliance issues before filing and prompts the taxpayer to correct issues at the pre-filing stage.

Comparative View of the Leading Countries

Countries such as Russia, Kenya, Brazil, Australia, and Singapore continue to evolve and innovate in the area of digital tax administration through investing in tax monitoring, e-filing, e-invoicing, e-payments, and digital identity. Our research shows that the most common *Tax Administration 3.0* building block that each of the countries above have achieved is “Taxpayer Touchpoints” (see Table 1). This goes to show that to successfully digitalize tax administration practices, the experience of key users of the system, the taxpayers, should be the main focus. Educating taxpayers on tax policies and practices and ensuring they have continuous support throughout tax administration processes is at the core of achieving *Tax Administration 3.0*.

A further common theme identified through looking at the above country profiles is the importance of trust between the government and its taxpayers. Russia’s optional tax monitoring system has increased trust between taxpayers and the tax authorities as taxpayer data, including daily transactions, can now be monitored and verified by the Federal Tax Service of Russia. This permission granted to the tax authority has increased the government’s trust in taxpayer data being reported. A similar observation can also be made for other countries that have incorporated automated reporting of taxpayer data into their tax returns. Russian authorities believe that enhancing taxpayer trust will encourage voluntary compliance with their tax policies. On the other hand, obtaining taxpayer trust proved to be a challenge for Kenya in implementing M-PESA. Looking at Singapore, the government’s success in revamping its tax administration system and introducing significant changes was met with positive feedback from its citizens, largely due to the relationship of trust the government had built with citizens in this area. The experiences of these nations show that as government agencies introduce changes to their tax administration policies, it is important to ensure a relationship of trust exists with the taxpayers or that there are systems in place to gain their trust as changes are launched.

RISK CONSIDERATIONS AND CHALLENGES

While there are countries such as Russia, Kenya, Brazil, Australia, and Singapore that have digitally transformed their tax administration practices, there are many nations that are lagging, despite the importance and need for tax digitalization. A country in this situation is China. China’s strengthening digital economy provides both an opportunity and a challenge regarding tax management (Chun-Xiao, 2021). The exponentially increasing amount of internet users, increasingly profitable Internet of Things industry, and increasingly popular cloud computing industry have highly contributed to China’s increasing digital economic national income. However, China’s current tax management process has been identified as inefficient and proven to be costly, resulting in large tax losses (Chun-Xiao, 2021).

E-filing and other e-government practices must be implemented at the government level as government bodies are the sole entity with the capability and capacity to bring together private and public sector organizations and government agencies to implement tax digitalization practices (Shao et al., 2015). Transforming into a digital economy has been recognized as a goal by the Chinese government with plans in place for e-government services (Shao et al., 2015; Chun-Xiao, 2021). In China, e-tax filing was first adopted by the city of Guangzhou (Shao et al., 2015). By 2005, e-filing was adopted by further provinces and the process was standardized at the government level. However, despite investments from the Chinese government to progress to e-government, the nation has faced overwhelmingly low levels of participation from its citizens (Shao et al., 2015).

Shao et al. (2015) conducted a study with 96 enterprises in China to test 9 environmental, technological, and organizational factors to determine which impact business adoption of e-filing practices. Their research results revealed that the factor which contributed most significantly to a businesses' intention to adopt e-filing practices is the level of government oversight, this includes the government's attitude towards e-filing adoption and incentives offered by the government to accelerate adoption by businesses (Shao et al., 2015). A second factor that was found to impact tax e-filing adoption is the level of complexity of the system. Adopting a new digitalized practice for the first time can be intimidating. However, even if the new system is complex, if it is automating the existing tax filing process, there is an incentive to adopt it as it is lowering the business administrative costs related to tax filing and increasing the efficiency of the process (Shao et al., 2015). Executive support was the third factor that was found to significantly impact e-filing adoption, but in this case, it was a strong negative relationship. Executive attitudes towards e-filing can severely impact the business's intention, especially since China has not mandated tax e-filing (Shao et al., 2015). The final factor revealed to significantly affect business intentions to adopt tax e-filing is human resources. A positive correlation was identified as the demand for and supply of individuals specializing in IT has been relatively balanced with China's commitment to IT acceleration. Therefore, business intentions of tax e-filing have been positively affected by more specialized IT personnel (Shao et al., 2015). Lastly, Shao et al. (2015) revealed that business size and type of business organization have a strong negative effect on a business's intention to adopt e-filing practices. Their study revealed that state-owned corporations and larger-sized corporations are less inclined towards e-filing practices due to their reservations about complex technology being adopted into their already complex business systems.

A PATH FORWARD

Based on the above case studies of countries that have successfully implemented the building blocks of *Tax Administration 3.0*, countries that are keen on digitizing their tax administration processes should recognize that unless systems are adopted and processes put in place at the national level, change will be slow to occur. That's because businesses that may want to update their internal systems would look to the government for guidance on the direction the country is headed in, with regards to tax administration digitalization, before committing to taking action unilaterally. With a general trend towards digitalization overall, the population of a country at large needs to have the skill sets required to sustain, maintain and advance the digitalized systems underway. On this front, there is a need to advance digital literacy education as part of school curriculums. Higher education institutions can also add specific courses that will aid in developing skill sets similar to the ones required to achieve the standards under *Tax Administration 3.0*

For companies and businesses looking to move forward on the path of digitalization, an important step would involve developing human resource plans that provide sufficient training to staff and efficiently allocate scarce resources, providing support at the executive level to employees in communicating the high-level IT strategy and internal resource management, and reducing the complexity of modern technologies being adopted (Shao et al., 2015). With government oversight being identified as the most significant factor affecting business intention to adopt e-filing, governments should ensure there is sufficient coordination at all levels of government to oversee the regulations and implementation of incentives for adoption (Shao et al., 2015). Shao et al. (2015) also discuss the importance of government bodies providing support for businesses, such as offering training and consultation. Lastly, the findings on business size and type of business ownership discussed above also imply that given their complexities, support or type of incentives offered should be uniquely designed for state-owned corporations and larger businesses to encourage higher adoption levels (Shao et al., 2015).

Tax Revenue, GDP, and Digitalization

It has been argued that Digitalization provides a net negative impact on the future of tax, for example in Vito Tanzi's article, *Globalization, tax competition and the future of tax revenue* (as cited in Hanrahan,

2021). Tanzi considered each new advancement in technology, including e-commerce, as a “fiscal termite” that would result in a significant decline in revenues of OECD countries in comparison to GDP (Hanrahan, 2021). As a result of this warning, it is important to review Digitalization measures against tax revenues within all 36 of the OECD countries, specifically since 8 of the top 10 countries for e-commerce sales around the world fall under the OECD.

As the countries profiled in this article illustrate, digitizing tax administration improves the performance of tax authorities. Among other things, e-filing and more organized record keeping has increased taxpayer compliance and improved the efficiency of tax collection. Further, Digitalization is an important aspect of innovation and growth, which is associated with improving the capability to increase revenues in the future for government agencies. It may assist with economic growth, productivity, international trade, and many other economic indicators given that there has been no evidence of tax revenues being affected by “fiscal termites.” Indeed, national tax revenues have increased between 1990 and 2018, the period where digital tax administration processes became widespread across OECD countries.

Observations – 2007-2020

Static analysis results completed by Hanrahan (2021) indicate that Gross Domestic Product (GDP) per capita was negatively correlated to tax revenues in addition to the value-added, contributed by agriculture, and the unemployment level including the previous banking crisis. Based on findings from Gnanon and Brun (as cited in Hanrahan, 2021), countries that reduce their Internet gap would be able to increase tax revenue collected through digital means. In this area, low-income countries stand to benefit the most. Given that Hanrahan observes a negative correlation between GDP and tax revenues, it is possible that Digitalization may actually impede the ability of tax organizations to increase tax revenue/compliance in highly digitized jurisdictions (Hanrahan, 2021). This supports Tanzi’s theory of “fiscal termites,” indicating that Digitalization is placing pressure on revenues, which in turn could explain the role that policymakers in OECD countries are increasing pressure on solutions to tax issues relating to digitalization (Hanrahan, 2021).

On the other hand, dynamic analysis results from 2007 to 2018 illustrate that digitalization is positively correlated with tax revenues at the 10% level, suggesting that the increase in mobility in recent years has created a positive effect on tax revenues (Hanrahan, 2021).

According to the OECD (2021), tax revenues as a percentage of GDP fell by 0.1 percentage point between 2018 and 2019, from 33.5% to 33.4%, primarily from a decrease in corporate tax revenues offset by an increase in personal tax revenues. On the other hand, tax revenues as a percentage of GDP increased by 0.1 percentage point between 2019 and 2020, from 33.4% to 33.5%, due to GDP decreasing more than nominal tax revenues during the COVID-19 pandemic (OECD, 2021). This means that despite a continuous push for tax administration to become more digitalized, digitalization itself may not be a significant factor in increases or decreases in tax revenues as a percentage of GDP. This data supports the findings of Hanrahan (2021).

In African countries, including Kenya, tax transparency and exchange of information (EOI) standards have been in place since 2009 to assist in reducing tax evasion (Global Forum on Transparency and Exchange of Information for Tax Purposes, 2021). Since then, EOI standards have helped African countries collect over EUR 1.2 billion in revenue from tax, interest, and penalties (Global Forum on Transparency and Exchange of Information for Tax Purposes, 2021). This is a clear indication that the use of EOI standards in the future will provide nations with more tax-related revenue whilst reducing domestic and cross-border tax evasion. In addition, these countries have implemented, or are looking to implement, automatic exchange of information (AEOI) standards to further increase tax revenues without the need to request information from companies (Global Forum on Transparency and Exchange of Information for Tax

Purposes, 2021). As of July 6, 2021, Kenya has agreed to provide the KRA with exchanges of information of various companies automatically commencing September 2022 (Ogutu, 2021). The implementation of this new standard is expected to decrease tax evasion while exponentially increasing tax compliance and tax revenues, illustrating that the Digitalization of tax administration may indirectly lead to changes in tax revenues in relation to GDP (Global Forum on Transparency and Exchange of Information for Tax Purposes, 2021).

Where Canada Stands

Canada's system of taxation has come a long way since the days of paper filing, paper slips, and manual taxation. As a result, *Tax Administration 2.0* standards as laid out by the OECD have been largely met. At present, about 95% of individuals in Canada file their tax returns electronically (Government of Canada 2023). The Canada Revenue Agency's MyAccount system has improved year-over-year, with new features added with every passing taxation cycle. Slips are now recognized by the system and can be automatically pulled from the CRA's database and inputted into most tax software programs. Many returns, such as GST/HST filings, can be done digitally through the NETFILE service.

Despite this, when contrasted with some of the achievements of the countries examined above, Canada has been slow in achieving positive results through digital innovation in tax administration. Canada does not have interagency data sharing as seen in Singapore, nor is filing as simple as in Singapore (try filing Canadian tax returns in twelve clicks or less). Canada lacks the ingenuity of the benchmarking system in Australia, as well as lacks the ability to confirm a business' details online in mere seconds, as can be done in Brazil, which would save both taxpayers and the government money spent on costly compliance auditing. Kenya has fully developed e-invoicing due to the rapid development of its digitized tax administration and payment systems, which is also lacking in Canada.

Even if the will exists, Canada will struggle in certain regards to mimic these achievements of other nations. As noted repeatedly in the *Tax Administration 3.0* guidelines, changing from 2.0 to 3.0 is neither painless nor straightforward. Governments and corporations alike must choose to accept these advances for them to be successful. However, with functional systems in place, convincing leadership to change from a working system to something new, even with the long-run benefits listed above, is an uphill battle. Implementing new systems can cost organizations millions of dollars, as noted in the above research on Singapore. Governments and corporations can also learn from China's experience of resistance from taxpayers and additional factors that must be considered to motivate and support taxpayers to use the digitalized tax services offered by their government.

Based on discussions with industry personnel in Canada, many Canadian companies continue to be tax reactive: they do not want to commit to big digital investments within their organizations until there is more government guidance or regulations introduced. This is consistent with research findings by Shao et al (2015), discussed above, which support that a key factor that contributes most to a businesses' intention to adopt digital practices is the level of oversight, which includes the government's attitudes towards adoption of digital initiatives such as e-filing adoption and incentives offered by the government to accelerate adoption by businesses.

CONCLUSION

This paper reviewed the most important aspects of the *Tax Administration 3.0* report by the OECD and highlighted countries that have been successful in adopting the guidelines contained therein, structured around a set of core building blocks. One key finding based on our review was that no country has been able to fully adopt all recommendations, underscoring the aspirational nature of the OECDs report. Canada has seen great technological advances in taxation over the past two decades with the growth of the internet,

but there are nations, developed and developing alike, that have taken greater strides and are comparatively ahead on the digitalization spectrum.

There remain many ways in which tax administration in Canada can be rendered more accurate and efficient through digital means, which is evident by the standards obtained by other countries. Kenya's automation of tax payment services, Brazil's online dispute management system, and Singapore's complete digital identity for taxpayers, to use just a few examples, demonstrate why Canada must continue to modernize its systems and services. Increased transparency, long-term cost savings, and increased efficiency are just some of the many benefits of further digitizing tax administration.

Future research can benefit from investigating the relationship between tax digitalization and sustainability reporting in taxation. Recent times have seen a substantial increase in discussion on Environmental, Social and Governance (ESG) related topics including ESG and sustainability reporting. The underlying goal with both digitalization and sustainability reporting in taxation is transparency. The impact of digitalization of tax administration will enhance sustainability reporting and this research will be beneficial and will inform corporate decisions on both the digitalization and sustainability reporting front. ESG reporting, driven by investor and consumer demands for transparency, has significantly increased over the past few years. ESG is the responsibility governments and organizations have towards the environment, society and the governance framework followed. There has been some research conducted linking digitalization and ESG (See Kai Chang 2023), however no such research has been conducted from a tax perspective.

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