



LAUNCHING A DIGITAL TAX ADMINISTRATION TRANSFORMATION

WHAT YOU NEED TO KNOW

MAY 2022

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On the cover: Tax administration reform through digital transformation is a key component to improving tax administration capacity, efficiency, and speed. Preparing for digital transformation requires careful planning, clear vision, and effective implementation. A comprehensive digital road map provides a blueprint for action to ensure that resources and initiatives are aligned with the strategy/objectives of the state institution.

Cover design by Cleone Baradas.

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Acknowledgments

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Executive Summary

This report is a component of work by the Asian Development Bank (ADB) supporting the digital transformation of tax administration. Such transformation can be an important part of a medium-term revenue strategy (MTRS), providing a mechanism to dramatically improve compliance. Success requires a high level of commitment on the part of policymakers, a communication strategy that focuses on stakeholder management, and a fully articulated implementation plan (road map).

The role of tax administration has changed dramatically in the past decade, and the pace of change has accelerated sharply in recent years due to the development and implementation of new technologies, and application of technology to the functions and processes of tax administration. From mobilizing stimulus payments and other fiscal incentives for vulnerable populations to strengthening domestic resource mobilization (DRM) to stabilize finances and invest in development, tax administrations are compelled to accelerate digitalization and further explore innovative technology solutions. This can help them to address unprecedented opportunities and challenges, and to collect more of the revenue due through efficiency gains, wider scope, and expansion of responsibilities.

Although the overall objectives, functions, processes, and technological focus of “the tax administration of the future” may be shared across borders, the journey in scope, timing, phasing, and choice of instruments is unique to each context. This report seeks to capture these elements of commonality, and differences in journeys and endpoints to present a comprehensive overview of digital transformation of tax administration. The report seeks to bring together a discussion of strategies and objectives (planning), a list of solutions and technical instrument options, and an approach to implementation.

This report is an overview that surveys and analyzes the issues and areas that policymakers from ADB members would want to be familiar with to embark on planning and implementing a digital tax transformation of the tax administration. In particular, the report provides an overview of the potential rationales for undergoing a transformational reform, the elements needed to build a strategy and an implementation plan (digital road map), an outline of the potential endpoints, and the risks and challenges in undertaking the reform, as well as a discussion of the possible impacts. A basic assessment framework is included in “digital road map,” which is intended to support the initiation of planning and mobilization.

Furthermore, this report presents the enhanced objectives in moving to a tax administration of the future, the drivers underpinning the evolution of tax administration’s role, and sets out the need for technological solutions to power the future state institution. The report also assesses the benefits and challenges, impacts, and risks of a digital transformation journey. This assessment also looks specifically at digital transformation of tax administration in a developing country context. The study concludes with a section focusing on the planning and stepwise implementation of a digital tax administration transformation or a “digital road map.”

The report underscores that digital transformation of tax administration is a crucial step in meeting the objectives and enabling the evolved functions of tax administration now and in the future. Although much has been written and studied about what the “end-state” or “future-state” tax administration looks like, the experience of governments along the journey so far has revealed that there is not a single endpoint but rather a continuous process consisting of many individual steps. Thus, most countries are on a continuum. In addition, how far a governments goes in digital tax administration is dependent on a number of factors, including strategic vision, levels of capacity, funding, and political will. The path, timing, and ultimate endpoint of each jurisdiction in creating a tax administration of the future are unique.

Introduction and Context

This report is intended to provide a compendium of the elements involved in the transformation of digital tax administration, surveying and analyzing the issues and areas that policymakers from ADB members would wish to be familiar with to embark on planning and implementing digital transformation of the tax administration. In particular, it provides an overview of the potential rationales for undergoing transformational reform, the elements needed to build a strategy and digital road map, an outline of the potential endpoints, and the potential risks and challenges in undertaking the reform, as well as a discussion of the possible impacts. The report draws from the experience of governments in Asia and the Pacific, as well as around the world.

Automation has been at the core of the government modernization agenda for decades; the pace of change has accelerated sharply during the last 10 years due to the development and implementation of new technologies, application of technology to the functions and processes of tax administration, as well as the need for meeting the demands to collect more of the revenue via efficiency gains, wider scope, and expansion of responsibilities. Specifically, tax authorities have sought to improve their efficiency and effectiveness in collecting revenue, as well as to provide better taxpayer service by harnessing information and communications technology (ICT) systems, data, and automation.

The coronavirus disease (COVID-19) pandemic and the ensuing economic crisis have created a unique, time-sensitive opportunity for governments to act on these initiatives with greater urgency. From mobilizing stimulus payments and other fiscal incentives for vulnerable populations, to strengthening DRM to stabilize finances and invest in sustainable development, tax administrations are compelled to accelerate digitalization and further explore innovative technology solutions to address unprecedented opportunities and challenges.

Tax administration reform through digital transformation is a key component to improving tax administration capacity, efficiency and speed to handle the big data flows (in diverse formats) and complex taxpayer activities that are currently in effect today, with the expectation that the scope and frequencies will continue to increase. At the same time, digital transformation applied to tax administrations is an ever-evolving series of enhancements. Although there has been a lot written and studied especially about what the “end-state” or “future-state” looks like, the experience of governments along the journey so far has revealed that there is not a single endpoint but rather a continuous process consisting of many individual steps.¹ Thus, most countries are on a sort of continuum.

¹ See Forum on Tax Administration (OECD, 2020). Tax Administration 3.0: The Digital Transformation of Tax Administration. <http://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/tax-administration-3-0-the-digital-transformation-of-tax-administration.pdf>.

The Organisation for Economic Co-operation and Development (OECD) Forum on Tax Administration (FTA) conceptualized a tax administration's digital transformation journey by sketching the starting point, in-between stages, and aspirational endpoint as follows:

- “Tax Administration 1.0” a paper-based tax administration, traditional functions;
- “Tax Administration 2.0” an e-administration, where most of the functions are digitized, although the fundamental processes are the same (but faster and more efficient); and
- “Tax Administration 3.0” represents a paradigm shift, where the taxpayer and tax administration systems are interconnected, where compliance is automatic and seamless, and where traditional decision functions are done by technology.”²

The endpoint, as envisaged today, is a completely digitized, automated tax administration which is driven by data automatically streamed from the taxpayer, captured, cleaned, filtered, matched, and warehoused for assessing risk, audit, dispute, and other processes.

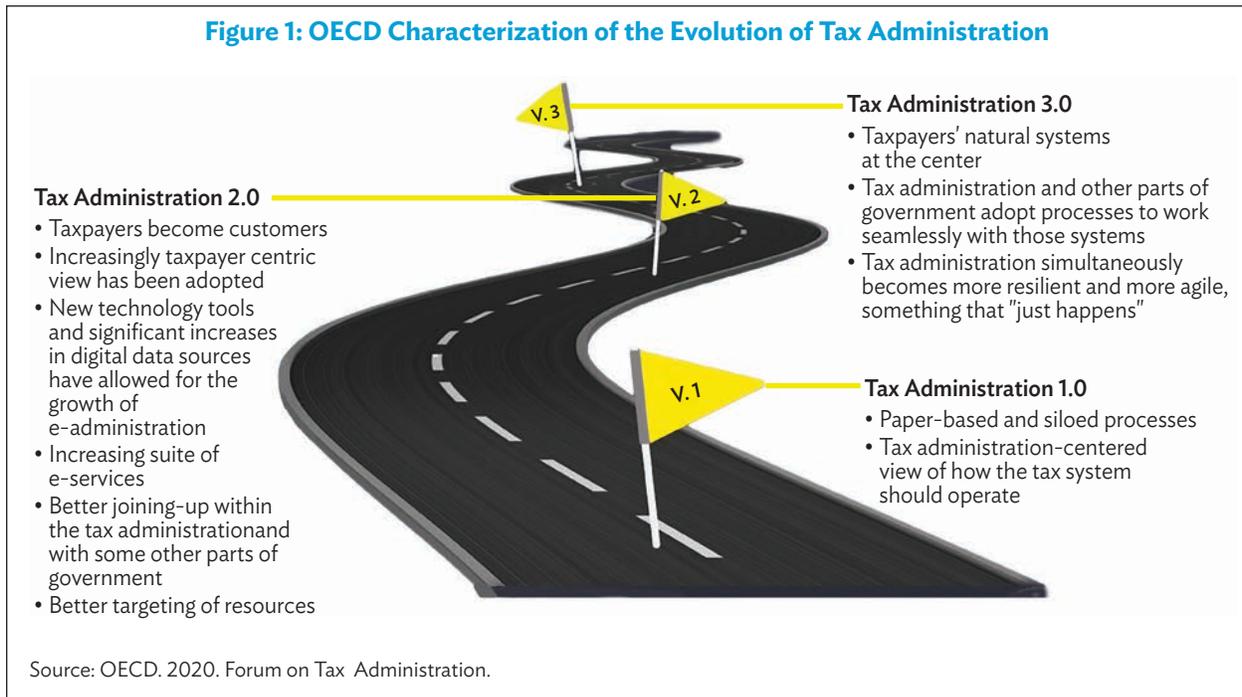
This framework helps visualize evolution. In practice, however, digital transformation rollouts have been stepwise, modular, and phased, albeit in the direction of travel outlined by the FTA. The following are general observations from jurisdictions that have adopted a digital transformation strategy and begun to implement pieces:

1. Governments share similar visions about what the ultimate goals are: movement to a seamless tax administration process where all functions that were previously manual “just happen” through the application of technology.
2. Approaches vary widely in terms of speed, scope of each change step, and short- and medium-term strategies.
3. As a “continuous process”, digital transformation of tax administration is being implemented in steps or defined modules due to a number of factors (e.g., financing, absorptive capacity, strategic vision, and political buy-in).
4. At the same time, there are regional similarities in the adoption of specific processes (e.g., e-filing and e-invoicing across Asia and the Pacific) and technologies, suggesting that there is some role for coordinating digital transformation steps.
5. Specific technologies or application of specific technologies are being implemented in many places, so cataloging these tools is possible (e.g., artificial intelligence used for predictive functions such as risk assessment).
6. Commonality of key challenges and risks to implementation are emerging; the scope and amplitude of these issues depend on a number of factors, including the baseline (start point), capacity both in government and in business, and the depth and breadth of technological and/or infrastructure penetration.
7. Good practices are also emerging to guide policymakers on how to plan a digital tax administration program (strategy) and implement it (road map).³

² OECD. 2020. Forum on Tax Administration. p. 7.

³ See Christopher Sanger. 2020. *Tax Authority Approaches to Digital Tax Administration*. EY Global Presentation. pp. 5 and 25-30. 30 October.

Figure 1: OECD Characterization of the Evolution of Tax Administration



To summarize, although the overall objectives, functions, processes, and technological focus of “the tax administration of the future” may be shared across borders, the journey in scope, timing, phasing, and choice of instruments is unique to each context and depends on the maturity of digitalization development. This report seeks to capture these elements of commonality and differences in journeys and endpoints to present a comprehensive overview of digital transformation of tax administration. It also seeks to bring together discussions of strategies and objectives (planning), a list of selected solutions and technical instrument options, and an approach to implementation (impact targeting and road map). The report is divided into sections as follows:

- Setting the context: what is the economic operating environment tax administrations operate in?
- Technology: as the key component “powering” transformed tax administrations; what are the different components and how are they used?
- What does the future state tax administration look like: objectives, drivers, characteristics, functions, and the role of technology?
- What does the journey look like? What has been the response so far, and what is the current state of play?
- What are the possible impacts of digital transformation of tax administrations? How do we measure it?
- What are the risks and challenges associated with a digital transformation journey, and what would mitigate risks?
- Are the benefits, challenges, impacts, and risks in digital transformation different for developing countries?
- Some basics on how to plan for a digital transformation of tax administration: a basic assessment framework and the road map.

Context

Digital transformation of tax administration is an important part of a country's larger DRM agenda, and it plays a key role in achieving the revenue collection goals set out in a MTRS. When policymakers decide to undertake digital transformation of the tax administration, the main objectives are generally to enhance efficiency, speed, and transparency; to lower compliance and administrative costs dramatically; and thus, to collect more revenue through enhanced compliance. Digital tax transformation strategy, planning, and implementation should be linked to the larger tax agenda, and hence, make use of all the tools available for DRM reform: diagnostic tools like the Tax Administration Diagnostic Assessment Tool (TADAT). TADAT can set the baseline for a reform plan, as it measures tax administrations in terms of efficacy and productivity, as well as responsiveness to taxpayer needs, all of which are components of compliance.⁴

Tax administration reform, in general, is an ongoing process; however, there are “surge” moments when policymakers look toward tax administration to deliver more (most often during economic downturns when tax policy instruments are less productive as economic activity slows down). These moments present unique opportunities to strengthen and reform tax administration and, in particular, for innovative thinking and deploying new techniques. The COVID-19 pandemic and subsequent economic crisis may be such a “surge” moment; however, this time, the focus appears to be on digital transformation to address the issues raised during the pandemic (including the need to perform tax administration functions remotely). In addition, the role of tax administration has been expanding in part because of the increased access to and growth in digitally accessible data.

The remainder of this section discusses the context and drivers underlying the current push for digital transformation of tax administration.

Macroeconomic situation

This report was written as the effects of the COVID-19 pandemic and economic impact were still unfolding. Until the onset of the COVID-19 pandemic and the economic impact hit in the first quarter of 2020, the global economy was growing steadily around 2%–3% of gross domestic product (GDP) per year in real terms over the past 5 years. Growth slumped by 3.6% in 2020 because of lockdowns across the globe.⁵ In the Asia and the Pacific region, GDP growth was 5.8% in 2017 but had been declining before 2020, with 4.6% recorded in 2019. Once again, the year 2020 experienced growth fall into negative territory estimated at -2.2%, albeit a lower decline than the global average.⁶

Foreign direct investment (FDI) globally had also been gradually declining from a high of \$1.6 trillion in 2017 down to just under \$1.5 trillion by 2019. The United Nations Conference on Trade and Development estimated FDI for 2020 stands at only £859 billion. The Asia and Pacific region, in contrast, had seen rising FDI from 2016 to 2018 up to a high of \$611 billion, before falling in 2019 to \$498 billion ahead of the COVID-19 outbreak.⁷

⁴ See Tax Administration Diagnostic Assessment Tool (TADAT). www.tadat.org/home.

⁵ World Bank (Global Data Base). <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG>.

⁶ International Monetary Fund, World Economic Outlook. <https://data.imf.org/?sk=ABFF6C02-73A8-475C-89CC-AD515033E662>.

⁷ United Nations Conference on Trade and Development (UNCTAD). [diaeiainf2021d1_en.pdf](https://unctad.org/publications/diaeiainf2021d1_en.pdf) (unctad.org).

The Asia and Pacific region has a higher-than-global average tax-to-GDP ratio around the 20% mark compared with 15% global average, but well below the OECD average 33.8% (all figures 2019).⁸ These statistics highlight that the Asia and Pacific region lags far behind OECD countries, suggesting that much can be done to increase revenue generation. Digital transformation of tax administration can play an important role in achieving this goal.

The effects of the COVID-19 pandemic on tax administration

The COVID-19 pandemic and the ensuing economic crisis have acted to accelerate both rethinking the role of tax administration and strategic thinking on how to reshape tax administration to reach the design of the future. In particular, tax administrations faced the following issues:

- sharp declines in revenues due to shrinking economic activity;
- sharp declines in revenues due to stimulus packages that relaxed tax administration, such as through tax filing and payment deferrals, exemptions, and reductions (e.g., value-added tax [VAT]; pauses in collecting data and documentation (e.g., transfer pricing); and a slowdown in processing returns;
- in Asia, where tax competition is strong, especially in the Association of Southeast Asian Nations (ASEAN) region, hesitance to raise tax rates or implement new instruments during the recovery due to competitiveness concerns and growth; and
- move to remote working, making some traditional tax functions more difficult to execute (especially audit).

In addition, tax administrations were tasked with new assignments, such as creating the gateway for taxpayers to access stimulus programs and benefits. Tax administrations used new technology to trace and track payments, undertake analytics on taxpayer behavior during the pandemic, etc. These new roles have further expanded the scope of tax administrations' remit.

Evolving Role of Tax Administration

The role and functions of tax administration globally have been evolving rapidly over the last decade, expanding from being the implementing arm of government tax policy to including becoming the entry point for large financial data sets and the first interface between the citizen and government. This process appears to be accelerating further in response to the COVID-19 pandemic and the economic fallout, as governments are more heavily relying on tax administrations both to boost revenue generation and to be the interface between the government and taxpayer during the support and stimulus rollout. To enable and support this evolution, tax administrations have been adopting new technologies, which handle all aspects of the taxpayer lifecycle, including decision-making and predictive (risk) functions, that is, digital transformation is powering the evolution of tax administration currently and in future. This section explores the drivers and enablers underpinning a future state tax administration.

⁸ OECD. 2021. Revenue Statistics in Asian and Pacific Economies 2020. https://www.oecd-ilibrary.org/sites/d47d0ae3-en/1/3/3/index.html?itemId=/content/publication/d47d0ae3-en&_csp_=6196cc19853874c4af684559c52add44&itemIGO=oecd&itemContentType=book; and ADB. 2020. A Comparative Analysis of Tax Administrations in Asia and the Pacific. p. 6. <http://dx.doi.org/10.22617/TCS190240>.

An evolution in objectives

The goals of a tax administration of the future (“Tax Administration 3.0”) build on the traditional objectives of “Tax Administration 1.0” and capture the widening of scope. The following objectives govern most transformation journeys of tax administration, regardless of how far along the way they are:

- seamless, highly efficient revenue collection through optimized and automatic (streaming) administration of the tax system, capturing a wider tax base, which includes the use of data-based approaches that minimize tax gaps without necessarily increasing tax rates or adding new instruments;
- enhanced transparency data security and trust through using digital platforms to drive the main tax functions, tax registration, filing, payment, and dispute resolution, to make processes clear for taxpayers, ensuring that all payments are traceable, thereby reducing corruption;
- minimized compliance burden through implementing digitized, streamlined, direct submission, processing, and assessment, thus reducing time;
- enhanced tax administration efficiency by rethinking the interface with business, especially in supplying compliance data, applying technology to undertake, accelerate, and streamline decision-making processes, such as in assessment and audit through using AI, machine learning technologies;
- advancing growth and other policy objectives (beyond but related to tax administration), such as being the nexus between taxpayer and government programs (e.g., in rolling out economic stimulus packages) and becoming the government’s data bank; and
- using enhanced taxpayer data to undertake analytics (e.g., to track payment and use of cash transfers, monitor consumption of goods for health, and model taxpayer response to new instruments such as carbon taxes).⁹

The operating environment and drivers

The expansion of tax administration roles and the change in core focus from taxpayer function to a seamless process driven by data are responses from external and internal pressures, as well as to the development and application of new technologies.

External drivers

Over the past 15 years, the global tax agenda has evolved rapidly and has affected both the operating environment and the role and functions of tax administration. These drivers have affected the strategy and objectives of tax administration, as well as the business processes, procedures, and use of technology.

1. *The Tax Transparency Agenda and Big Data Flows*

The tax transparency agenda began to accelerate rapidly starting in 2009, when the restructuring of the Global Forum for Transparency and Exchange of Information for Tax Purposes had two profound effects on tax administration.¹⁰ The first effect was the availability of data. The process started with the acceptance of

⁹ Marcello Estevão. 2020. Why Digital Transformation Matters for Taxation. *World Bank Blog*. 12 June. <https://blogs.worldbank.org/voices/why-digital-transformation-matters-taxation>.

¹⁰ Although the push in 2009 and later was focused on compelling, especially multinationals and high net worth individuals, to disclose sufficient tax data to allow tax administration initially to determine whether an entity’s chain of transactions was set up solely to avoid or evade tax, the impact on tax administrations was strong as they were compelled to receive, store, and use data that had not existed before.

the need for exchange of information for tax services to prevent profit shifting and to promote transparency. The mainstreaming of exchange of information on request led to the introduction of automatic and spontaneous exchange, which necessitated the tax authority to have the following capabilities:

- to send and receive large data sets;
- to clean, filter, and securely store data; and
- to use the data in the detection and assessment processes.

Second, the volume, frequency, and speed with which data are exchanged now are larger, regularized or frequent, and extremely fast, compared with that in 2009 (including the Common Reporting Standard, FATCA (US), and Country-by-Country Reporting). In addition, the successive data leaks (such as the “Panama Papers”) demonstrated that data flows can happen in a disorderly fashion and need to be accommodated as well. As a result, tax administrations needed to reconsider both the logistics (technology) of handling big data sets and capturing sources of information (see below).

2. *International Tax Agenda*

The international tax agenda also accelerated around 2009, with a renewed focus on the impact of high-speed, globalized (multinational) movements of goods, services, and financial flows, the transfer (mis)pricing issues especially in developing countries, amid the revelation that some large multinationals were paying low levels of corporate income tax (2012). All of these events led to the launch of the Base Erosion and Profit Shifting (BEPS) Project. The focus on developing or strengthening tools for tax administration to use to combat BEPS required a substantial investment in capacity and audit tools, along with upgrading customer service to be able to keep up with these highly resourced intensive new workstreams.

3. *Digital Economy*

a. Digital taxation and new tax administration instruments

The global focus on adding taxation of the digital economy began intensively in 2015. Although tax instruments and treatments have been debated for the last 5 years without consensus (to date) on a direct tax approach, there has been agreement that tax administration needed to be expanded to administer tax instruments, provide supervision over compliance, and have the tools to enforce rules to promote compliance. In this process, tax administrations began by requiring that all those with digital footprint, such as nonresident providers of goods and services, digitally register that footprint. The digital footprint has been built through compulsory registration (usually for VAT and/or a digital services tax instrument) and is now a good practice globally.

To date, the main tax instruments in use are indirect taxes (VAT and sales taxes), along with digital services taxes which, although they are meant to be a proxy instrument for income tax, operate as a sales tax. The provider is charged with collecting the tax at final use (destination), and remitting it to the government, which implicitly assures a fixed gross margin. Supervision can occur through tracking payments, for example, and enforcement for noncompliance by blocking websites used for delivery. Like the international tax agenda, the digital agenda has expanded the tax base and necessitated an expansion of scope and tools of tax administration.

b. New digital service delivery (platforms)

Businesses and individuals engage in increasingly large-scale transactions with digital platforms, and tax administrations currently have limited means of taxing the income or profit those platforms generate. Digital platforms that facilitate online transactions between buyers and sellers play a key role in the strong growth of online trade. Two-thirds of all cross-border e-commerce sales of goods are made through online marketplaces and are projected to reach \$33.80 billion by 2026, growing 3.4% from 2019 to 2026.¹¹ Digital platforms also facilitate transactions between users in the sharing and gig economies. Taxation and supervision of activities on digital platforms have resulted in a new thinking of defining taxable events taking place in digital platforms and by the end user, along with new technological solutions to administer existing (indirect) tax instruments.

Internal drivers

Internal drivers include the evolution of compliance management and the introduction of a seamless flow of data between the taxpayer and tax administration. The core, primary function of any tax administration remains collecting revenue and ensuring compliance. The approach to compliance management has undergone a substantial evolution in the past decade, in part due to the transparency revolution, availability of financial data, and exchange of information. Essentially, with increased volumes and frequencies of information flows, tax administrations understand more about taxpayer activity without having to request information. More information, combined with technology-driven analytics, have also enabled tax administrations to speed up processing taxpayer data and to decrease direct contact with the taxpayer.

In the transformation between a tax administration of today and one of the future, the relationship between the taxpayer and the tax administration radically changes, from an adversarial approach (the taxpayer is compelled to file and pay and then tax administration ensures it is correct and true) to a collaborative approach (where the flow of taxpayer data takes place in real time and is assumed to be correct at the outset).

These factors change compliance management from focusing on tax returns to focusing on analysis of continuous data flows (including return data, along with automatic data flows, and use of third-party data) and result in faster, more efficient tax administration. It allows tax administrations to extend collaborative compliance management programs, taking it to a new level by only contacting a taxpayer if a risk flag is raised, instead of requiring annual returns.¹² For smaller enterprises and individuals, digitization of tax functions has also led to lower compliance costs and intervention by the tax administration.

In the tax administration of the future, basic compliance is assured through technology: a taxpayer's financial accounting systems would be seamlessly and digitally connected to the tax administration, such that data flow seamlessly and are assessed against transaction/sector/economy norms continually being updated by the tax

¹¹ Data from Verified Market Research. 2021. Digital Experience Platform Market Size and Forecast 2021. <https://www.verifiedmarketresearch.com/product/Digital-Experience-Platform-Market/>.

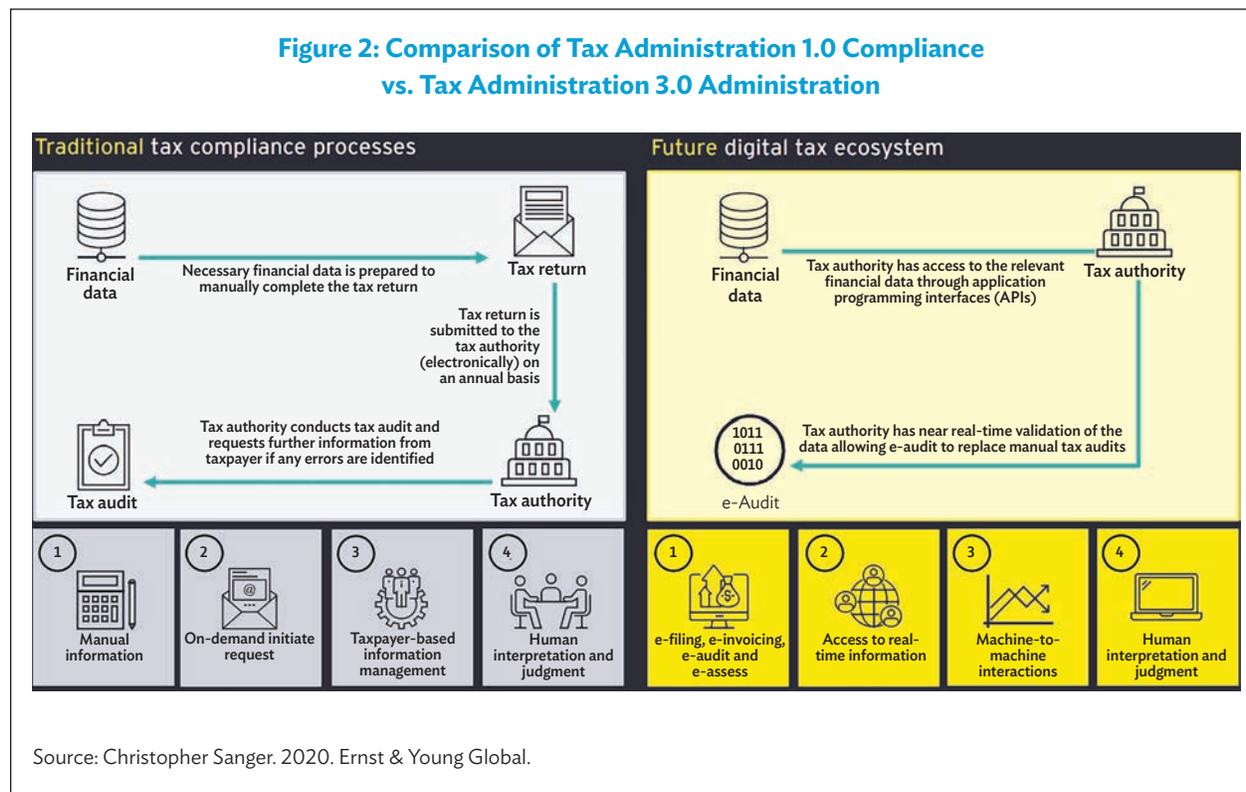
¹² The concept of "cooperative compliance" has been in existence since the early 2000s at the central government level and was elaborated upon in greater depth by the OECD in its "Study into the Role of Tax Intermediaries" in 2008. In 2013, the OECD released a further document "Cooperative compliance: A Framework—From Enhanced Relationship to Cooperative Compliance." Essentially it is an agreement between large taxpayers and the tax administration exchanging more than statutory required data in exchange for trust (i.e., lighter hand tax administration). Countries using cooperative compliance programs in Asia include Australia, Japan, the Republic of Korea, New Zealand, and Singapore.

administration system (machine learning technology). Any major difference triggers a red flag, passed on to the taxpayer for explanation.

To achieve a seamless flow of data, reporting requirements (including at the transaction level) are captured in taxpayers' source systems, which are linked to the tax administration.¹³ The OECD characterizes this change of relationship as embedding the tax administration within "taxpayer natural systems":

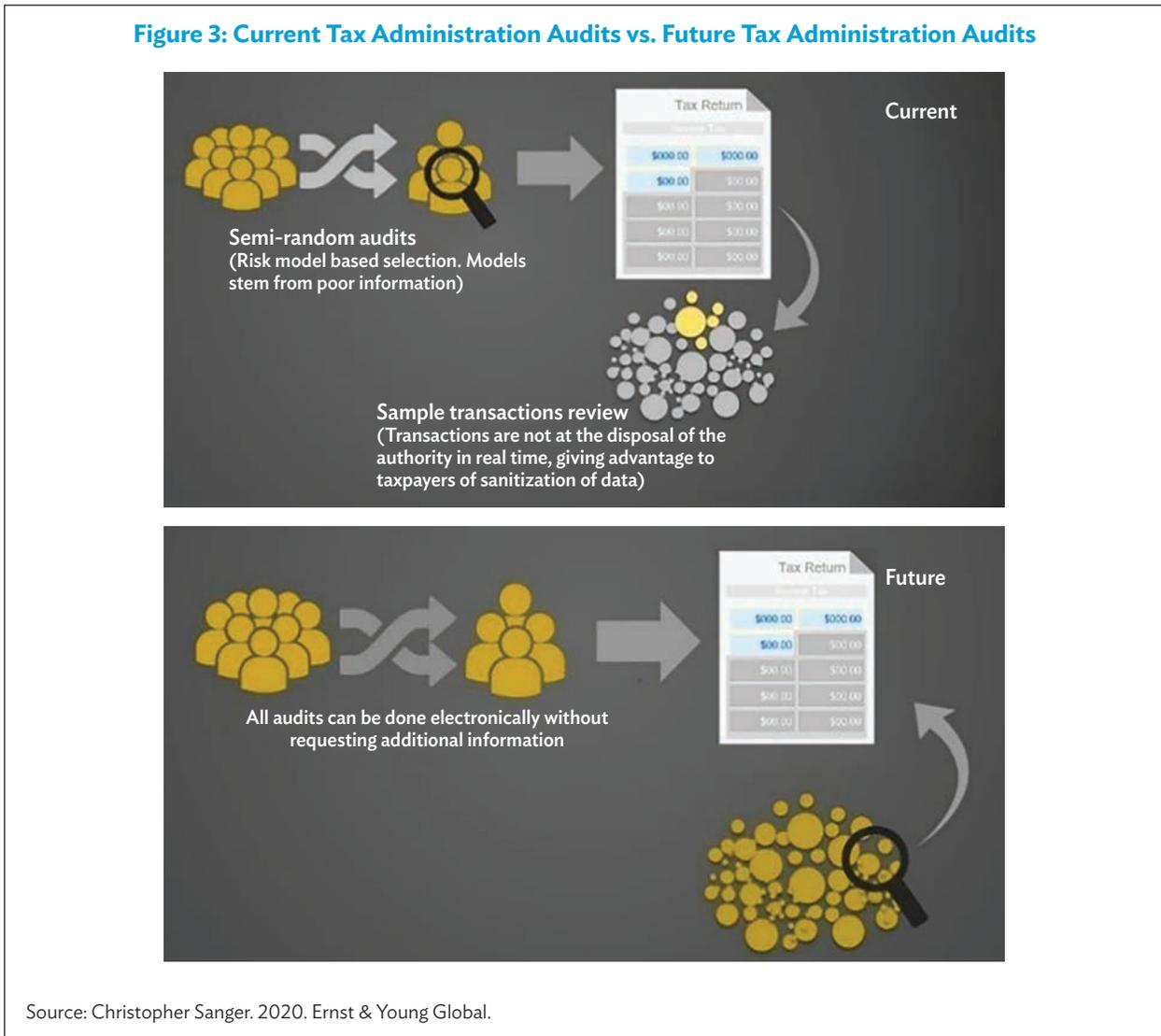
Paying taxes will become a more seamless experience over time integrated into daily life and business activities as much as possible. Natural citizen and business behaviors and systems will increasingly be the starting point of taxation processes. Tax administrations and private sector organizations will increasingly collaborate in creating innovative and joined-up services, adding value to the taxpayer, reducing administrative burdens and assuring secure, transparent and highly reliable outcomes. Adapting taxation processes to fit in with taxpayers' natural systems will facilitate compliance by design and "tax just happening." Free-riding and being non-compliant will increasingly require deliberate and burdensome additional activities.¹⁴

Figure 2: Comparison of Tax Administration 1.0 Compliance vs. Tax Administration 3.0 Administration



¹³ A very simple version of this concept was implemented in Chile, where cash registers send VAT information at the time of sale to the revenue service.

¹⁴ Footnote 1, p. 12.



Currently, most tax administrations are somewhere in between these audit process extremes (essentially manually driven vs. driven by predictive technology). In many cases, tax administrations interrupt the data flow system to feed data manually through a risk filter for scoring, and then decide (manually or through a threshold test on risk scoring) which entities or individuals to audit.

Finally, the role of taxpayer service has also evolved dramatically in the past decade. Fueled by rapid expansion of complexity, especially in the international tax arena, combined with increasing disclosure or transparency requirements, and push for tax certainty, the demands on taxpayer service for more specialized assistance have increased dramatically. To meet the demand, tax administrations have had to rethink how to deliver higher value, more extensive taxpayer services, including the implementation or expansion of rulings and guidance on both transactions and reporting. Technology has played a strong role in upgrading and upscaling taxpayer service through targeted tech solutions, such as chat bots to increase coverage and availability of taxpayer service, service portholes to both match taxpayers with programs and initiate formal processes (such as tax disputes and applications for rulings).

How Tax Administrations Use Technology Today

Development of Technology

The rapid development of new technology supported the shift in emphasis from tax administrations relying on taxpayer behavior and information as the main focus of tax administration to data-driven operations as the basis for all functions. Data-intensive procedures are now used to close tax gaps and are able to capture tax avoidance or evasion without necessarily increasing the level (rates) or scope of taxation.

At the beginning of the tax technology revolution, governments focused on e-filing to ensure especially accuracy and as a first step in digitizing data. During this period, tax administrations had begun experimenting with using third-party data to monitor compliance (ranging from external data collection to cross check filed data, use of internet research, and foreign data sources).¹⁵ This expansion of assessment and audit techniques also required both data matching, filtering, and storage and later the use of predictive technology (and machine learning technology), which could run risk assessment operations using a variety of sources and formats.

Waves of Tax Administration Digitization

Tax administrations need to respond to the changing technological landscape to meet the expectations of taxpayers, as well as to maintain security and improve their efficacy. There are three technological waves that have or will impact the digitalized tax administration: basic, consolidated, and optimized.

The initial wave included basic digital technologies, which ensured that tax information was being stored in a digital manner. This essential step, away from paper-based processes, was merely a conversation of analog processes to digital ones. Tax returns could be e-filed, auditing could be automated, the quality of data could be interrogated, and various tax processes could be integrated. Most countries in Asia and the Pacific have reached this phase or are in transition.¹⁶ For example, Singapore has completed its last phase of compulsory e-filing for corporate income tax returns in 2020. Similarly, the tax authority of Japan has also embarked on compulsory e-filing for corporate income tax return for large business.

The next wave is one of consolidation and is characterized by a rapid evolution to implementing new technologies but also a movement away from traditional tax administration processes. Using basic analytics, data warehousing, new sources of information can be linked to taxpayers opening up new possibilities for tax administration analysis

¹⁵ Footnote 1, p. 10.

¹⁶ Christopher Sanger. 2020. Tax Authority's Approaches to Digital Tax Administration. Presentation. p. 7. 31 October.

for the first time. Setting up data-handling rules allows for easier automation of processes. This has led to tax administrations being able to offer taxpayers innovations such as pre-filled tax returns, combining personal tax with social security in personalized dashboards. These innovations largely operate the same processes as the pre-digital era; however, technology has provided greater efficiency and better customer service opportunities for tax administrations. With the implementation of National Digital Identity (NDI) in Singapore, Inland Revenue Authority of Singapore (IRAS) has been able to roll out the “No Filing Service” scheme for individuals, where their tax returns are pre-filled with the data collected by IRAS via NDI.¹⁷

Through this step, there has been significant increases in efficiency and speed with respect to tax administrations. For many tax administrations, especially from low-capacity countries, this phase is an intermediate end-point, as it addresses issues, such as lowering compliance and administrative costs, data pooling, and seamless data flows, but does not involve surrendering control over the pre-assessment and audit processes as the next phase involves.¹⁸

The new wave is one of optimization. There are two significant shifts with this wave: control and managerial. In the first two waves, the tax administration would control the design of the flow of information and create processes to optimize the dataflow. With innovations like predictive analytics, machine learning, and deep neural networks, people are allowing computers to self-optimize their own systems and processes. This is a significant change in what tax authorities are controlling. With self-optimizing technologies, tax authorities may not know the processes being used by technology in a few years’ time. They would need to control the direction of the technology but not the minutiae of the process. The second shift is thus managerial. Leaders and managers of tax authorities need to reimagine the purpose and operations of tax authorities where machines are optimizing the data ahead of decisions being taken.

The implementation of advanced technology in this phase requires a change in “mindset,” as tax administrators give up sole control of direct intervention and decision-making power in the pre-assessment, risk assessment, and audit processes. Instead, this is supplemented by AI technology or other predictive technologies. With non-fungible tokens (NFTs) running on blockchain technologies, what does a data warehouse need to look like in 10 years’ time?¹⁹ Will the tax authority software need to be integrated into other organization systems (e.g., banking) to capture VAT in real time with all data stored in blockchain ledgers? Such questions require a new approach to management and reimagining the digital tax authority of the future.

¹⁷ See Inland Revenue Authority of Singapore (IRAS). 2020. No Filing Service (NFS). <https://www.iras.gov.sg/irashome/Individuals/Locals/Filing-your-taxes/Individuals-Required-to-File-Tax/No-Filing-Service--NFS-/>.

¹⁸ It is important to note here that this point in digital transformation involves the use of new technology and rethinking work processes; however, in general, it does not require policymakers to give control over the risk and audit processes to advanced technology. Changing “mindsets” in tax administration, or specifically, allowing highly subjective processes such as audit and risk assessment to be automated is a key challenge for tax administrators globally.

¹⁹ An NFT is a unit of data stored on a blockchain that confirms that a digital asset is unique and therefore not interchangeable. NFTs can be used to represent items, such as photos, videos, audio, and other types of digital files. Access to any copy of the original file, however, is not restricted to the buyer of the NFT. While copies of these digital items are available for anyone to obtain, NFTs are tracked on blockchains to provide the owner with a proof of ownership that is separate from copyright.

Tax Administration Digitization and Technology in Use

Many tax administrations started the digitization process by automating basic functions: electronic registration and filing. However, more governments, especially in Asia, are moving to the next stage in digital transformation: enabling real-time transaction data to flow into the tax administration directly (e.g., through a cash register function or an online-accounting system which is linked to the tax administration data collection system).²⁰ This element in the digital journey, once working, represents a large step toward seamless, continuous data flow which would raise compliance rates and significantly lower compliance and administrative costs. For example, the People's Republic of China has been systematically implementing technology in rolling out its Golden Tax System, 1,000 Taxpayers Initiative, and blockchain invoicing pilots.

Figure 4: Use of e-Invoicing Technology in Asia and the Pacific, 2021

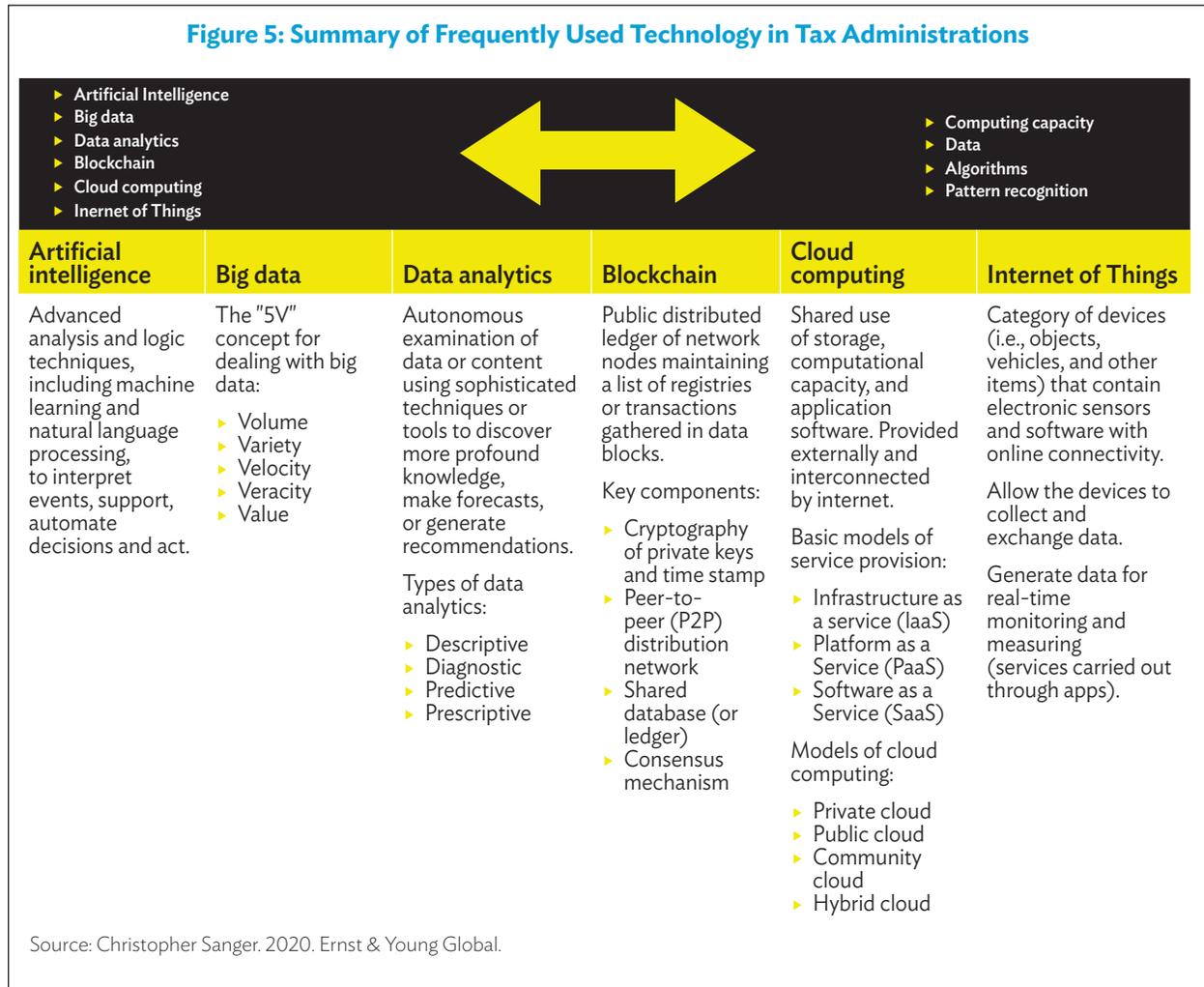
E-invoicing Requirements			
Australia		To watch	E-invoicing System
Peoples's Republic of China		Existing	Golden Tax System (GTS)
India		Upcoming	GST B2B e-invoicing
Indonesia		Existing	Mandatory B2B
Kazakhstan		Existing	Mandatory B2B
New Zealand		To watch	E-invoicing System
Philippines		Upcoming	E-invoicing System
Singapore		Existing	Mandatory B2G
Republic of Korea		Existing	Mandatory B2B
Taipei, China		Existing	Government Uniform Invoices (GUIs)
Viet Nam		Upcoming	Mandatory B2B

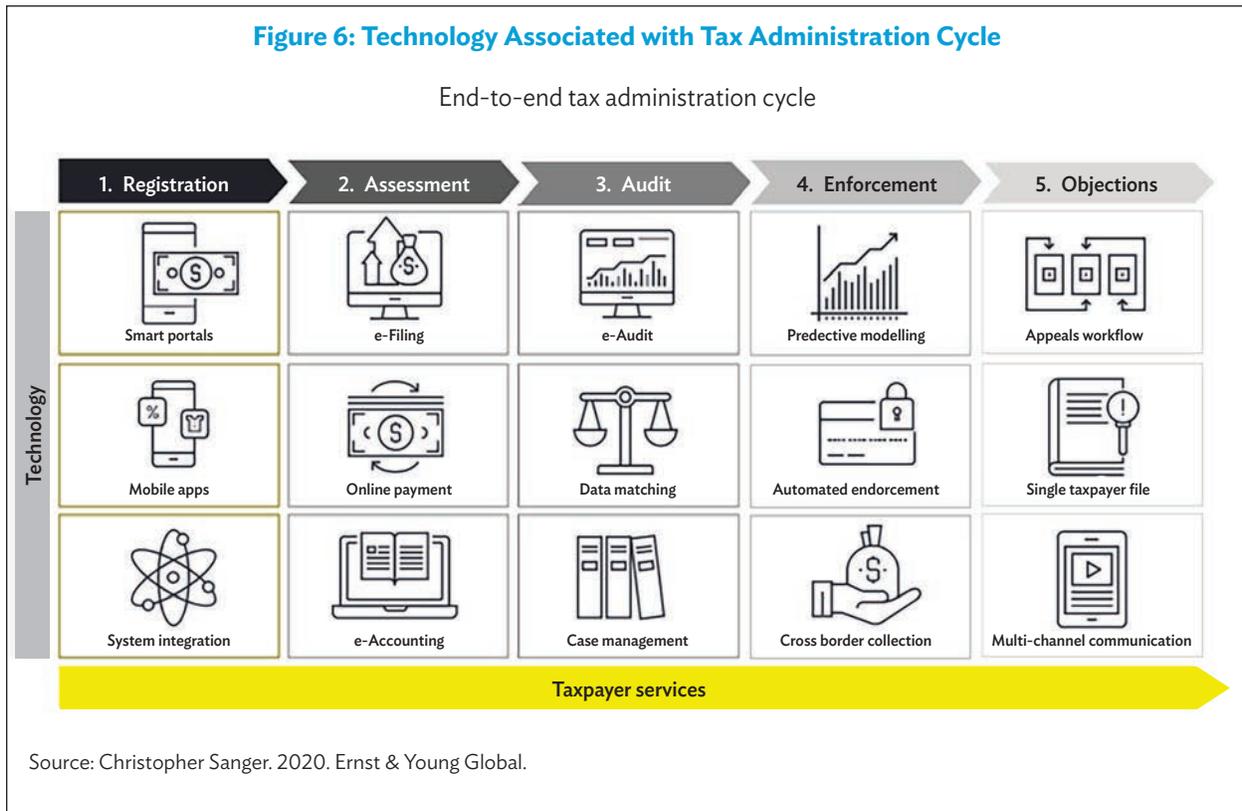
B2B = business-to-business; B2G = business-to-government

Source: Christopher Sanger. 2020. Ernst & Young Global.

²⁰ E-invoicing and real-time posting of data are big steps for tax administrations, which are used to either paper or electronic filing submissions. In order for e-invoicing to work, taxpayer data, especially the tax ID, name, and address must be entered exactly as was done during registration, as the first step within the tax administration system is to match the transaction to the taxpayers.

Fitted together, technology underpins all stages of the end-to-end tax administration life cycle. A wide range of technologies are used throughout the life cycle, with a few emerging technologies particularly visible, for example, advanced data analytics, cloud computing, and digital identity as shown in Figure 5 (explanation of each technology is set out in Appendix 1, page 41).





Many tax authorities within Asia and the Pacific regions are using digital solutions to improve taxpayers' services, including the provision of a single platform or application for taxpayers to manage their tax compliance matters. For example, the Australian Taxation Office (ATO) launched "MyTax" to provide comprehensive tax services for individuals, including lodgment of tax returns, verifying the processing status, and viewing assessments and refund claims.²¹ In addition, pre-filing tax returns by tax administration has reduced the taxpayers' compliance costs to complete tax returns as evidenced by the No-Filing Service scheme in Singapore.²²

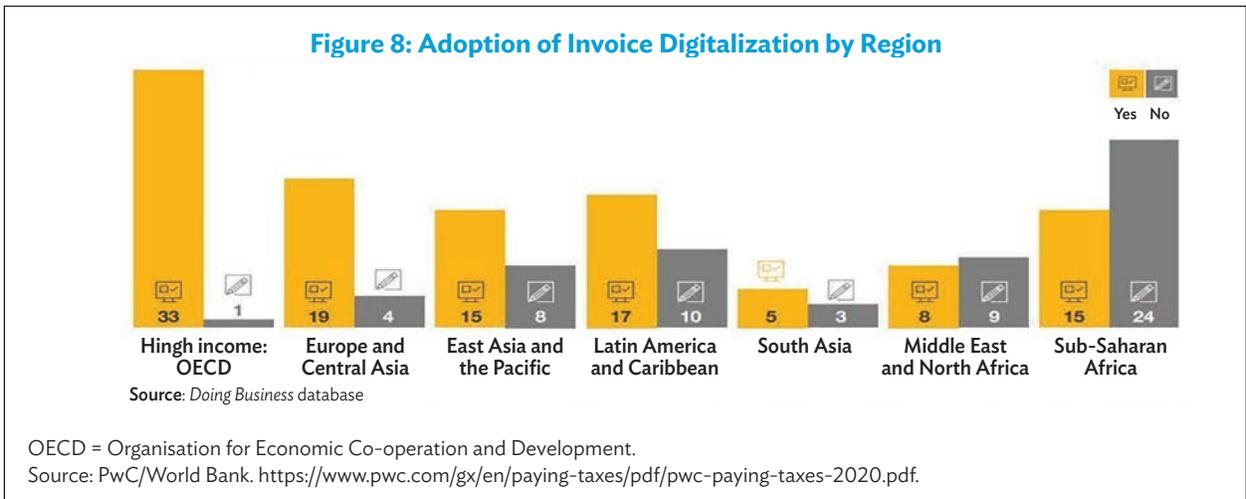
Of the global regions to have adopted technologies and seen a reduction in the tax compliance time, East Asia and the Pacific have been able to achieve the lowest average hours required per year, as shown in Figure 7.

²¹ See Australian Taxation Office. 2021. <https://www.ato.gov.au/Individuals/myTax/>.

²² As part of Singapore's Smart Nation journey initiative, a National Digital Identity (NDI) system for Singapore residents (SingPass) and business (CorpPass) was deployed to transact digitally with the government and private sector in a convenient and secure manner. The use of NDI enabled the collection of data from other agencies and partners (e.g., donation and provident fund) to provide seamless and personalized services for Singapore taxpayers.



When it comes to invoice digitalization, the high-income OECD countries have been the main adopters. The use of e-invoicing and data matching technologies on transaction invoices help to detect VAT fraud and enhance tax compliance and the amount of VAT collected. Tax authorities in Asia and the Pacific regions have started to collect digital invoice data although in different ways, for example, via government platform (Golden Tax System), over the Pan-European Public Procurement Online (PEPPOL) network, or via online cash registers (Figure 8).



A Digitally Transformed Tax Administration's Processes and Characteristics

Armed with the new possibilities created by technological development, tax administrations have the opportunity to reevaluate not just how they undertake their functions but also what existing functions remain necessary and what are the new activities they could undertake in pursuing the goals of tax administration. This section considers first what tax administrations are currently using new technology to achieve, before seeking to develop further the potential for greater advancement.

Current Trends and State of Play

The focus, to date, has been to fetch, decode, and execute on data that can be useful in assisting the tax administration's existing functions. A key target has been to increase the available sources of data and to enable the matching of those data sources with individual taxpayer records. This has generally resulted in the following key processes:

- 1. Collection of digital data:** Globally, tax administrations are gathering more digital data. The trend of gathering digital data comes in many different forms, including promoting e-filing, collection of data file, and collection of digital data from intermediaries and other government bodies. In Asia and the Pacific, tax administrations are focusing on promoting e-filing and collection of digital financial statement information. For example, tax administrations are actively promoting or mandating e-filing in the ASEAN region. In addition, there is a trend in Asia and the Pacific to adopt eXtensible Business Reporting Language (XBRL), which is a standardized international format, in collecting financial statement information. Tax authorities in Australia and Singapore are leveraging the same XBRL data collected by the company house.

We also see a trend in collecting transactional data for facilitating e-audit, especially from an indirect tax perspective. The Standard Audit File for Tax is a standardized format and approach in collecting transactional digital data being used for indirect tax analytics. In Asia and the Pacific, the People's Republic of China has been one of the leaders with its "golden tax system." The golden tax system was implemented with the aim of enabling highly efficient and automated processing of tax data by the State Taxation Administration. It was also implemented to tackle VAT fraud nearly real time. Currently, vendors are required to submit details of transaction directly into the Golden Tax platform for a VAT invoice to be valid.

- 2. Reliance on the tax governance framework:** Globally, tax authorities have started to base the allocation of scarce resources based on risk management principles to achieve a higher level of tax compliance. In Asia and the Pacific, we see similar trends in Australia and Singapore. The Australian Taxation Office (ATO) has launched a justified trust program to engage taxpayers in collecting objective evidence that a particular taxpayer pays the right amount tax. The Inland Revenue Authority of Singapore introduced the Assisted Compliance Assurance

Program (ACAP) to facilitate general sales tax (GST)-registered businesses to better manage their GST risks. Businesses may opt into ACAP voluntarily.

- 3. Extended application of advanced analytics:** Data analytics are currently used by tax administrations mostly for selection of tax audit cases and detection of noncompliance. Tax administrations have begun to apply techniques that identify potentially risky taxpayers or returns by comparing taxpayer data across sectors and segments. Digitized analytical processes are also being used across many tax-administration functions and activities, including tax payment management, revenue management, and taxpayer services. With the increase in data collection mentioned above, it is expected that the use of advanced analytics will further be extended.
- 4. Leveraging online taxpayers' service:** In view of the pressures of declining budgets and rising expectations among taxpayers, many tax authorities have made efforts to increase the use of online services for taxpayers. Providing taxpayers with a single platform and/or tax application on top of the traditional channels is definitely more cost-effective and provide better experience for taxpayers. With the COVID-19 pandemic, it is expected that the provision of online taxpayers' platform and services will continue to grow.

Getting to the Future

As noted above, the focus, to date, has been to automate current processes and increase their scope and efficiency. The processes of a future tax administration will include many of these, but will go far further, involving a rethinking of the processes and a reimagining of the means to achieve the desired ends. Technology enables a fundamental change in methods, resulting in the need for reconsidering choices in tax administration, which have become embedded in the tax regime, but which would not be included if designed today. This “zero-based” approach is complex to deliver and requires a clear vision of the ultimate aims of tax administration, rather than focusing on short-term deliverables.

The processes of such a tax administration would include the following:

- 1. Connected tax ecosystems:** With digitalization happening almost everywhere, other than tax authorities, all monitoring bodies and private sectors are collecting more digital data than before. Promoting data exchanges between government agencies and the private sector can reduce the overall administrative burden for businesses and provide a friendly business environment.
- 2. Embedding tax into natural systems:** Data collection has been a critical piece in enabling the technology transformation initiatives, for example, e-audit and pre-population of tax return. Embedding tax into natural systems can help streamline the data collection process for both taxpayers and tax administrators and enhance data quality with real-time data validation check. In Asia and the Pacific, the ATO has implemented the single touch payroll, which enables contemporaneous employer's payroll information to be supplied to the ATO. It embedded the employer's reporting information directly into the payroll batches and data management systems to enable the reporting of salary, taxation and superannuation data to the ATO. It requires partnering with software vendors and taxpayers to make the single touch payroll a success.

3. **Real-time taxpayer touchpoints:** Moving away from face-to-face or telephone traditional touchpoints with taxpayers, real-time support could be supported to taxpayers seamlessly through online services or even embedded into the reporting cycle of taxpayers. Real-time tooltips, backed by AI, could be implemented in both government software and third-party tax software.
4. **Extended data collection:** Data collection is no longer solely coming from tax returns and workpapers. In future tax administration, data collection could happen in the form of data file transfer or even embedding into the taxpayers' natural system as mentioned above.

Future tax authorities could rely on other intermediaries and other regulatory bodies for extending the source of data collection. Key players within the ecosystems include social security, insurance companies, financial institutions, land registries, stock exchanges and other tax authorities, etc. Data secrecy rules and data protection framework are the two key components to enable data exchanges.

5. **Data-driven tax assessment/tax audits:** Currently, most tax administrations are relying on professional judgment to enforce compliance, for example, manual desk review to identify tax audit cases. With big data, tax administration could become more data driven, for example, data-triggered tax audits and course of administrative actions backed by data.
6. **Reliance of tax control:** Many jurisdictions around the world have implemented a cooperative compliance or tax control framework approach to managing tax risks, especially for large businesses. A key part of these approaches is transparency, which is expected to be the trends in upcoming years. The advantages of taxpayers knowing their risk rating include behavioral change and improved controls of taxpayers, and better focused resources for tax administrations.
7. **Data security:** Data security, data management, and data governance have become key for future tax authorities. The complexity increases as the sources of data increase, along with the complexity of the data management system.

Characteristics of a Digitized Tax Administration

Having developed the above processes, the digitized tax administration will have the following key characteristics:

1. Driven by data

- Tax administrations are now being bombarded with big data flows, and there is a need to capture, clean, filter, and securely store the data.
- How to use the data is the key to the future.
 - » Because of the size of the flows, it is impossible for humans to be able to absorb and sort the data.
 - » Data analytics (including artificial intelligence and machine learning algorithms) can address these needs.
- Data will be used for each tax administration function.

2. Supported by technology

- **Processing big data flows quickly**, correctly, and efficiently is only possible with integrated technology.
- **Data analytics:** Algorithms to continuously analyze data and inform decision-making at key vantage points (e.g., registration approval, opening of audits, VAT refunds, tax debt management, and tax disputes), and can use AI and machine learning technology.
- **Data security and management:** Distributed ledgers (including blockchain) for network data management: when a tax event occurs (e.g., sale or import of goods), the data (e.g., TIN, amount, country of origin, and product code) can be safely preserved real time in an accessible blockchain.
- **Algorithmic translation of tax codes:** Complex rules contained within tax codes can be effectively translated into algorithms (and smart contracts), reducing discretion and promoting tax certainty.

3. Expanded taxpayer service via digital methods

- **Taxpayer service is becoming a frontline tool of tax administration and its scope is expanded to include the following features:**
 - » more active role in compliance management;
 - » guidance on operations and transactions;
 - » interface between taxpayer and many government services; and
 - » enhanced data validation upon submission.

4. Expanded special services (Large Taxpayer Offices and Transfer Pricing Units)

- As a result of the global tax agenda (including international tax, digital, global standard compliance), special services are becoming core functions of tax administrations.
- In particular, the shift to data and trust-based compliance management program units, such as the Large Taxpayer Office, has become essential for tax administration functions.

5. Enhanced transparency and trust

- Establishing digitized systems and platforms to carry out the basic tax functions—tax registration, filing, payment, and dispute resolution—to enhance transparency and certainty and to processes, provide assurances that tax payments are deposited in an actual government account, and eliminating avenues for officials to abuse their discretion.
- Implementation of technologies, such as the MIT-incubated OPAL (Open Algorithm), provides researchers, think tanks, or any citizen the ability to independently analyze tax data without having access to personally identifiable information.
- Good governance: A new governance architecture is established to address information security risks related to bias and manipulation of algorithms and transparency through open-source platforms.

6. Reduced the compliance burden

- There were 106 economies using electronic filing systems in 2020, double the number in 2004. Digital technology is reducing the time spent paying taxes, as well as the total number of individual payments taxpayers must make each year.²³

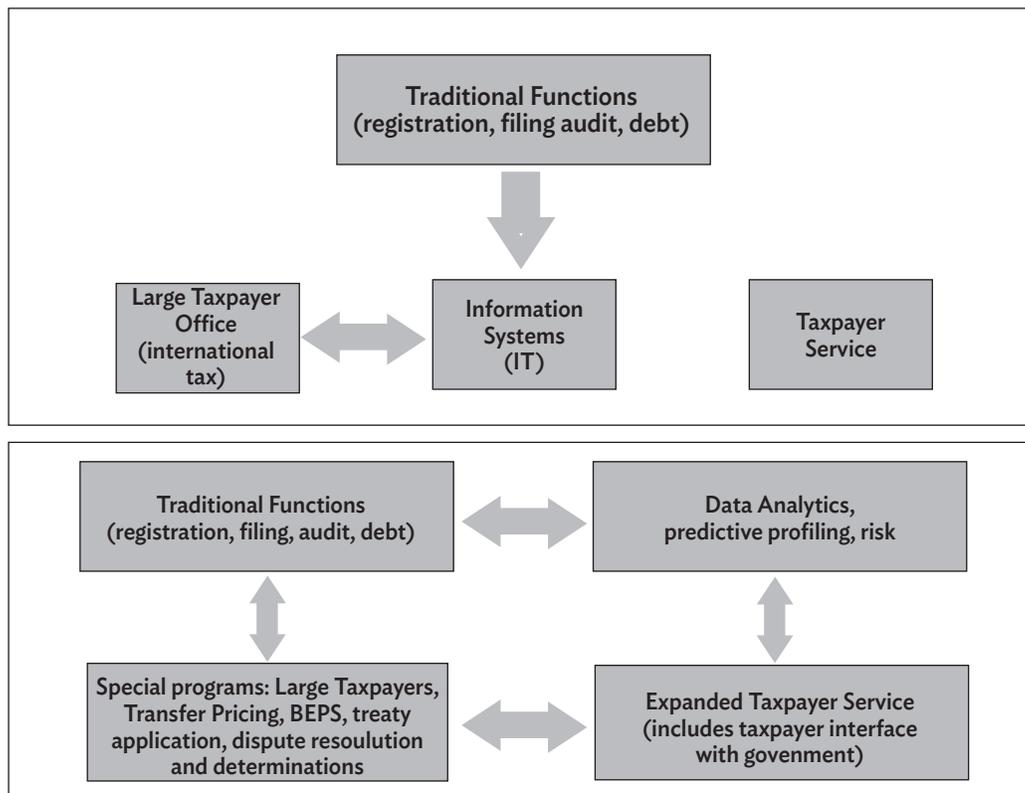
7. Embedded flexibility

- Digitizing administrative processes to accommodate remote working.
- Conversion of taxpayer functions to be done virtually (registration, filing, audit, and adjudication).
- Rethinking risk function to fully automate.

8. Future-proofed²⁴

- Ensuring processes, techniques, and technological solutions envisaged for today can be used or built in the future. The digital journey is continuous, not finite.
- Future-proof tax administration requires constant training and upskilling the workforce.

Figure 9: Evolution from Tax Administration 1.0 to Tax Administration 3.0



BEPS = base erosion and profit shifting.

Source: Designed by the authors for this study.

²³ World Bank/PwC. 2020. Paying Taxes. <https://www.pwc.com/gx/en/services/tax/publications/paying-taxes-2020.html>. p. 6.

²⁴ This risk is especially important to note, as tax administration transformations are nonending processes—even if an administration reaches today's endpoint, technology keeps evolving and tax administration roles will keep evolving.

Addressing Risk in the Digital Transformation Journey

A fundamental transformation inevitably involves risk, and as the functions of a tax administration are at the heart of government, careful planning, clear vision, and effective implementation are essential. This results in a natural caution in relation to transformation and can result in a series of small projects. A key to success is to ensure that such projects are coherent, and that they build on delivering the ultimate aims of transformation. At some stages, reform will necessitate large changes, rather than piecemeal ones, and practical choices (such as periods of parallel running) can mitigate some risks. Risk, in this context, includes noneconomic or technological risks, as well as political risk.

The Risks Identified

To date, the following issues have been identified in transformations of tax administration:

- 1. Lack of overall digital strategy:** Transformation initiatives are sometimes implemented piecemeal where a lack of overall strategy results in systems that are not interconnected to each other, low user adoption rates, insufficient data to support data analytics, etc.
- 2. Workforce engagement:** Successful transformation initiatives have to be implemented with workforce, operating model, capability, and innovative and sustainable design. These are all important building blocks when developing a digital strategy.
- 3. E-filing adoption rate and data collection mechanism:** The e-filing adoption rate impacts the amount of digital data collected by tax authorities. In Asia and the Pacific, some jurisdictions are facing a relatively low e-filing adoption rate. The availability of data is often one of the dependencies for other transformation initiatives, for example, data analytics and process automation.
- 4. Data exchange:** A common way to extend the digital data collection is conducting data exchanges with other monitoring bodies, for example, company house and stock exchanges. Hurdles faced by tax authorities include data secrecy and data protection regulations. Ideally, the legal framework should support a balance between the interests of taxpayers and those of tax authorities.
- 5. Change management and enabling processes:** Without a proper change management process, digital transformation is unlikely to have a full internal support. Hence, the system implemented may not be fully used and adopted by the practitioners. Thus, without a change in the processes, the systems are not used in a way it has been designed. In the end, the impact of automation achieved is less than expected.

In addition, the following lists some of the most common issues and risks in digitization, as noted by businesses, tax advisers, and tax administrators from 12 countries. The intensity of the risks facing any one tax administration will differ; however, considering each of the following risks noted by the Institute of Chartered Accountants in England and Wales and planning in advance will help reduce the risk²⁵

1. Legacy systems

All governments have at least some electronic element to their tax administration now. Older systems might contain vital data, which will need to be properly incorporated into the new system.

2. Complexity

Simplicity in design drives success: the older and more complex a tax system is, the harder it will be to create an understandable and reliable digital equivalent. The key is in the design of the reporting requirements; the aim should be a simple form, which requires only input data and the system undertake the calculations.

3. Limitations on the digitalized tax system

Pre-populated returns, for example, are limited to the information that is supplied to the government. It is possible that instruments, such as dividends, capital gains, foreign income, and rental income, are omitted (as that information needs to be supplied by the taxpayer or the foreign government). Similarly, many costs, such as allowable third-party disbursements and payments, may not be available to be pre-populated. In addition, any taxable activity that includes some kind of a choice in treatment is naturally not the most compatible with an automated system. The system should ensure that there is a place to input data missed in automatic data flows.

4. Security and privacy

In tax administration, there is high security threat due to the valuable and sensitive nature of the information in question. Similarly, digitization greatly increases the ability of governments to access private information, and to analyze and draw conclusions from it. Strict legal basis, including provisions for what, how, and when the data can be used, along with procedures and protections, should be in place to ensure taxpayer privacy and data security.

5. Project or scope creep

With large, long-scale projects such as tax digitization, it is natural to break down the goals into achievable objectives. Over time, implementation can start to meet the specifications of those objectives without actually proceeding to work on the rationale of the original goals. Regular high-level reviews of a project's goals are necessary to keep the detailed implementation on track.

6. Digital exclusion

Some users are unwilling or unable to make use of digital methods to interact with the government, or do not have records in the appropriate format for compliance. There must be a way for those who cannot comply with digital reporting to avoid penalty; this may be through the maintenance of traditional paper-based filing or via supporting a network of accessible and affordable tax agents who can file on the behalf of taxpayers.

²⁵ Adapted and modified from: ICAEW. 2019. Digitalisation of Tax: International Perspectives. <https://www.icaew.com/-/media/corporate/files/technical/technology/thought-leadership/digital-tax.ashx>.

7. Legislative basis

A proper legislative basis for digitalization must be established, for example, by including the legal status of digital records in court, the necessary powers to require digital filing, and a legislative basis for digital identity. Without a proper legal basis for the collection of information, the use of electronic data as evidence, and the requirement for data to be supplied in a given format, taxpayers will lack the certainty they need to plan their compliance activities and may resist or refuse to comply with the authority's requests.

8. Cost

While the benefits of digitalization may be clear, in the short term, the transition usually increases costs, and the gains may take some years to materialize. Mandatory electronic record-keeping and other required taxpayer activities will pass costs onto taxpayers, for example, European Union's adoption of XBRL as a requirement for listed company accounts.

9. Future proofing

Introducing a system that is reliant on current technologies or web standards, or that relies on fixed current best-practice elements, such as security, will limit the longer term usefulness of a system. Development should instead be focused on technology-neutral approaches and proofing against possible future changes—whether those be in technological capabilities and standards, in the preferred hardware and software used by taxpayers, or even changes in the tax regime itself.

10. Political risk

Political risk is defined here as the risk faced by a digital transformation project due to a lack of political support for the duration of the project. Political support is needed to ensure budgets are disbursed, people are deployed, and project management is in place from beginning to end. The risk is likely to be inherently high due to the scale, scope, and duration of a digital transformation project; however, it is heightened at the end of an election cycle, especially if there is a change in government and leadership. In addition, if public support for government changes during the project, this could pose a political or commitment risk to the journey.

An Approach to Risk Mitigation

One of the approaches to addressing these risks has been to consider seven “synapses” of digitization, all of which need to be communicating with each other to facilitate transformation at optimal risk:²⁶

1. Strategy and capability

Before planning for a technology road map, it is critical for tax authorities to define its transformation strategies and objectives. When designing strategies, it is important to “future proof”, that is, to ensure the technology implemented would support future requirements. Besides, enterprise-wide data strategy is a key area to consider. Integrated data planning allows efficient use of data across enterprises. Finally, the strategies must be backed by top management.

²⁶ EY Forbes. 2017. *Data & Advanced Analytics: High Stakes, High Rewards*. https://i.forbesimg.com/forbesinsights/ey_data_analytics_2017/EY_Data_Analytics_Report.pdf.

Ex ante commitments to see each project or phase to completion are essential to mitigate political or commitment risk. Importantly, funding should be allocated for the entire project (best case) or at least for each phase prior to implementation. Where the scope is large, the project can be divided into discrete phases; however, each intermediate endpoint should be standalone, such that the tax administration can function fully.

A communications strategy and stakeholder management approach should be developed at this stage. Stakeholders should participate in discussions of strategy, implementation, and what would be expected of taxpayers (e.g., a new computer system or electronic cash register). In addition, especially for low-capacity countries, stakeholder management could include capacity building for compliance (see the section on Application in Developing Countries, page 31).

2. An enabling operating model

Operating model and process play an important role in all technology transformation. As part of the technology road map design, the following factors from operation side should be considered, including designated administrative support, implanted disruptive tech mindset and cultural, technology-enabled operating model, etc. A future-proof operating model should enable the use of knowledge to drive informed decision-making.

3. Initiative design

Use pilots, sandpits and phased approach when building up the technology road map. It should also cover a rich mix of initiatives (e.g., data management, data analytics, case management, internal process enhancement, and taxpayer touchpoint enhancement). When evaluating and prioritizing the technology initiatives, it is important to score proposals with a consistent methodology and proper documentation.

4. Intervention design

Both internal and external change managements are key for a successful transformation journey. Early engagement of key stakeholders to take part in the road map planning is key to ensuring support throughout the project. Setting up of centers of excellence designated to spread the initiatives would warrant awareness internally and externally.

5. Manage workforce

As part of the technology road map, resources management also plays a role. Tax administration should create a talent management strategy in line with the technology implementation road map. It is expected that IT; statistical, analytical, and tax domain skills; and experience would be the skillsets of the future tax administration. Messaging around process automation impacts should be considered early.

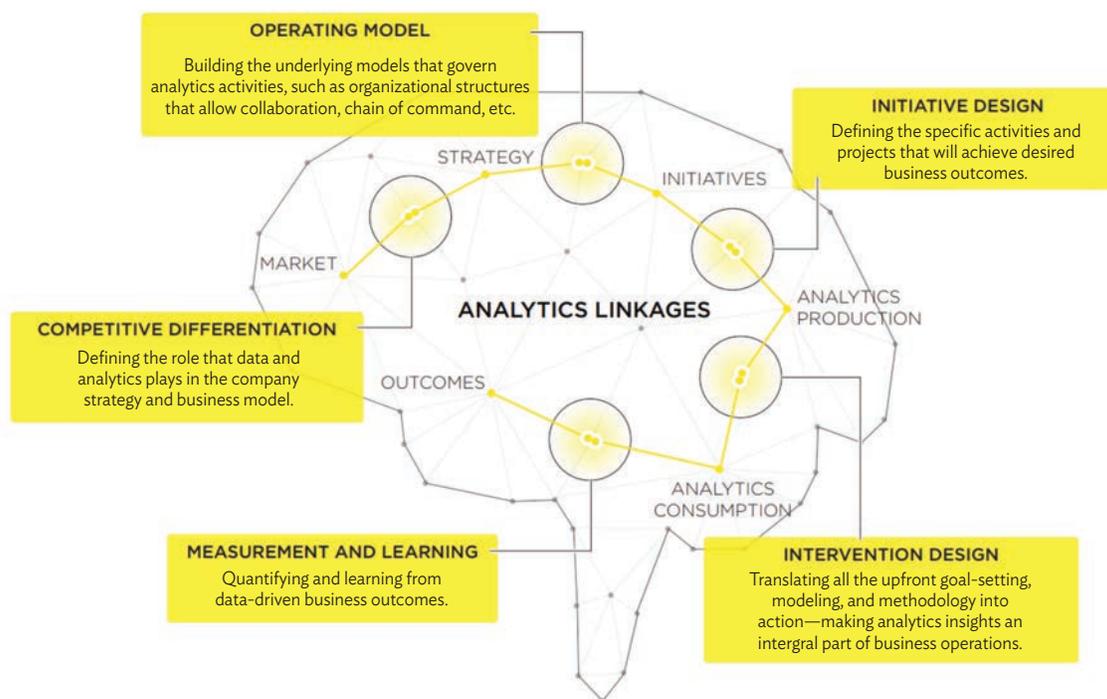
6. Manage results

Leverage multiple stakeholders' group, software vendors, etc., to manage the expectation on digital initiatives. Clear return on investment and business case at planning set the expectation on the foreseen results. Both financial and nonfinancial measures should be used to manage digitalization performance. A proper review would be recommended to evaluate the actual outcome, including analysis of KPIs set at the start and the degree to which objectives are met.

7. Learn and sustain

Global good practice is to use actual results and learnings to make decisions for further planning, embed lessons learned across organization and link outcomes to initial policy or guidance, and refine the technology road map from time to time as required.

Figure 10: Seven Synapses of Digital Transformation



Source: Authors, presented at ADB Tax Week, 22 February 2021.

Measuring Impact

Digital transformation for tax administrations, which is important for the development and enhancement of efficiency, transparency, and productivity in tax administration, is also a key component of a medium-term revenue strategy (MTRS) and domestic revenue mobilization (DRM), in general. Strengthening DRM requires optimizing tax policy and administration, which entails rethinking, visioning, and designing a plan for reform. To achieve this ambitious agenda, governments need to formulate country-specific and differentiated goals on both tax policy and administration. On the policy side, an MTRS can provide the components and road map for reform sustained by a medium-term government commitment. On the administration side, a road map of digitalization of tax administration will complement MTRS by providing a strong pathway to improve taxpayer compliance.

Assessing the impact of a digital transformation requires starting first with the objectives. As a starting point, it should be noted that Tax Administrations 1.0 impact assessments, like the Tax Administration Diagnostic Assessment Tool (TADAT) are designed to assess the ability of tax administration to carry out its traditional functions (registration, filing, assessment or audit, debt collection, etc.) and including a revenue measure.²⁷

An impact assessment of a digitally transformed tax administration should add additional measures to capture the enhanced objectives of the tax administration of the future. This section presents areas where digital transformation of tax administration would show impact and offers some possible measures, including measurement of progress toward the digital journey itself.

Effectiveness

1. Tax revenue generation

As the primary function of tax administration, the level and growth of revenues collected would be a key impact measure, and it would be expected that the expansion of tax base coverage, efficiency gains, and data-driven processes would produce a higher level of revenue.

Metrics: revenue-to-GDP, real revenue growth, tax instrument revenue-to-total tax revenue.

²⁷ TADAT covers nine areas of performance, each with a set of indicators. See <https://www.tadat.org/home>.

2. Compliance rates

Related to expected impact on revenue generation, compliance rates in a digitized tax administration would be expected to rise dramatically, as filing and reporting would be automatic for income, VAT would be e-invoiced, and customs and VAT data would be matched automatically.

Metrics: number of filers (complete)/registrants (per tax instrument and aggregated), number of taxpayers paying tax/registrants (per tax instrument and aggregated), number of tax dossiers completed (assessed and with zero tax balance)/number of registrants, also per number of filers.

3. Tax gap

One of the objectives of a digitally transformed tax administration is the ability to perform analytical functions, such as continually estimating the tax gap (both administrative and policy). With continuous data flows, the tax gap can be measured and the parameters (sources of the gap) monitored.

Metrics: using the analytics functions built into the system, tax gap measures can be developed, and the models run as new data flows automatically update the model. Tax gap information can be used both as a measure and as an input into policy and process changes.

Efficiency and Speed

1. Taxpayer function speed and efficiency

One important aim of a digitally enhanced tax administration is that by design, all taxpayer functions are automatically submitted and processed by the system (e.g., direct submission of taxpayer salaries from employers, obviating the need for filing a return, as well as e-invoicing). The efficiency gain, combined with the decline in compliance and administrative cost, should be a benefit, feeding into both revenue and compliance rates.

In addition, predictive technology feeding into risk and e-audit mechanisms should increase audit productivity and risk assessment accuracy. This, in turn, should generate more revenues and lower the mistakes (over assessments as well as under assessments). With a more accurate risk filter, unnecessary audits should decline over time and taxpayer satisfaction should grow.

Metrics: revenue, audit productivity (both qualitative and quantitative), risk-assessment measures, taxpayer satisfaction measures, time to complete tax refunds, compliance cost measures, administrative cost measures.

2. Resolution of tax cases, disputes, and assessments

Fast filing, assessment, and audit processes due to digitization should lead to faster resolution of outstanding tax cases and disputes.

Metrics: duration of audit or assessment cases, duration of dispute cases, taxpayer satisfaction measures of audit or dispute processes.

3. Exchange of information and international tax

The analysis of big data and the development and application of technology solutions for data lakes, instantaneous filtering and storage, should facilitate the ability to exchange information and adjudicate international tax issues (e.g., transfer pricing, treaty applications, and BEPS actions). It suggests that these processes should be fast, and cases resolved quickly. Even dispute resolution processes (MAP) can benefit from the big data analysis.

Metrics: time to complete exchange of information request, transfer pricing assessments, international tax operations; enhanced revenue generation from more accurate international tax assessments.

4. Measures of taxpayer satisfaction

A digitized tax administration should have positive effects on the taxpayer experience, as it should reduce compliance costs, reduce tax administration mistakes, and provide more enhanced access to taxpayer service, operations (such as rulings), and guidance through technology (e.g., digitizing help through bots). An improved taxpayer experience should affect both compliance and revenues generated, and qualitative data can be captured in taxpayer surveys.

Metrics: compliance cost measurements, compliance rate measurements, revenues, and taxpayer experience surveys.

Other Functions

1. Tax administrations as the connector between taxpayer and government programs

As tax administrations expand their operational scope to include being the nexus between the taxpayer and government fiscal programs (as with the stimulus), the tax administrations need to have portals and links with other governmental agencies providing service or support.

Metrics: number of taxpayers using the government portals via the tax administration to participate in government programs, program participation data, taxpayer satisfaction surveys.

2. Tax administration data reservoir as the government's data warehouse

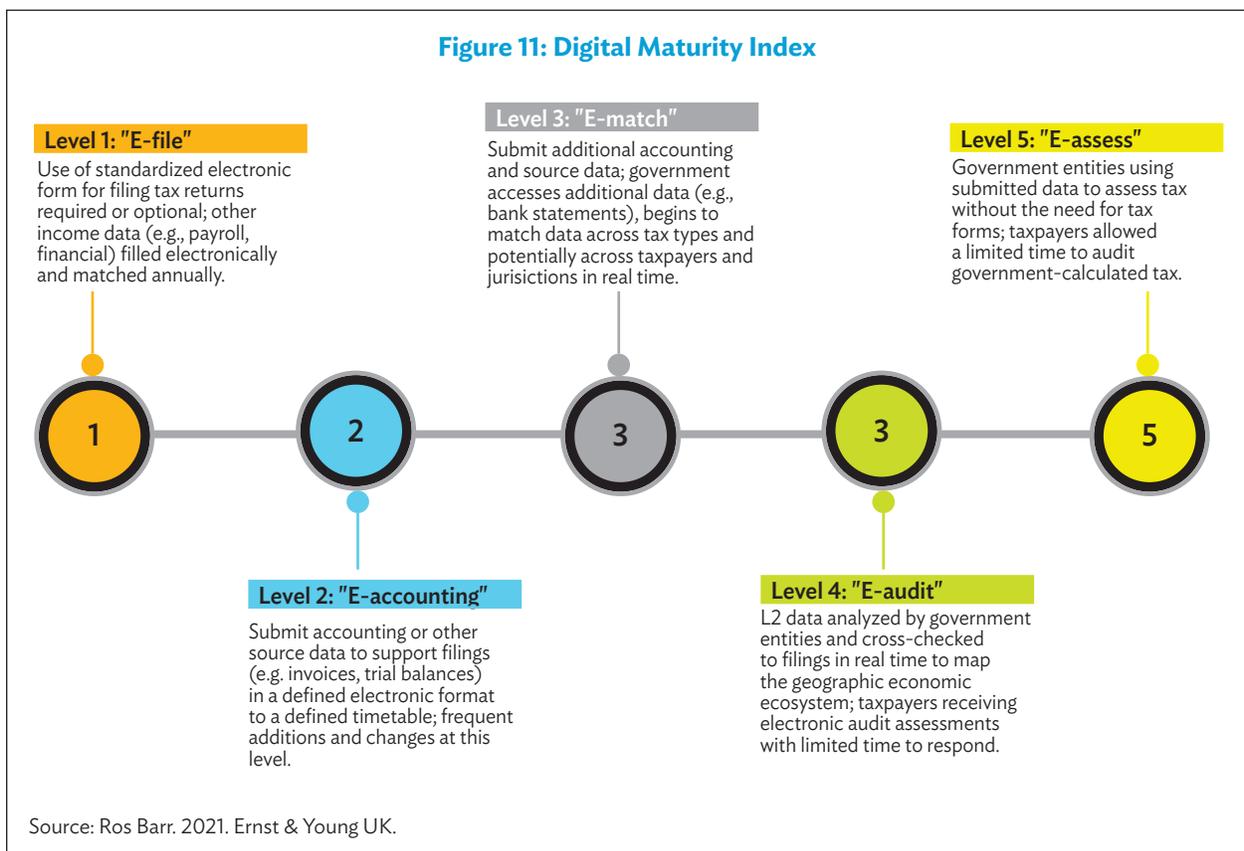
With tax administrations as the receivers and collectors of taxpayer data, which can be used for many purposes, the tax administration becomes a sort of data bank. This data repository is a potentially important benefit for the government as a whole, as the data are relevant to other government functions.

Metric: analysis of frequency and type of data used by government agencies in a given period.

The Digital Transformation Process

1. Digital maturity and development

As a way to set the baseline of the project, countries would need to assess where they are on the digital transformation journey. The forum on tax administration has developed a “digital maturity” schema, which divides the transformation process into steps or stages. In this context, a country could determine where it is on the digital maturity scale at the beginning of the project, plot where it would like to be at the end and determine progress according to where it maps to at a given time. However, it should be noted that this schema is one piece of the digital taxation journey.



2. Budget allocation and disbursement

Progress along the digital transformation path can be measured by how much expenditure has been disbursed compared to plan. As earlier noted, budgetary commitment for each phase (and better, for the entire project) demonstrates the government’s commitment to carry out the transformation program and also provides the basis for measuring progress. For example, under or slow, disbursement is often a sign of either procurement issues or problems with government commitment.

Application in Developing Countries

For developing countries, the benefits from undergoing digital transformation in tax administration are potentially powerful; however, there are challenges as well. This section highlights some of the main constraints, impacts, and risks for developing countries in the journey to a future state tax administration.

Factors and Challenges Affecting Digital Tax Transformation Baselines

Many developing countries face similar initial conditions and constraints, which are more profound and challenging than the baselines found in advanced economies. The following factors pose more challenges to a successful transformation journey as the gap between start and end-states is wider and deeper:

1. Capacity

Most countries at all levels of development are constrained or limited by capacity in tax, technology, and data management, although it is well documented that this constraint is most severe in developing countries.²⁸ On the government side, limited capacity affects the ability to carry out day-to-day tax administration operations (including audit), and most tax administrations in the developing world struggle to keep up with the basic set of taxes (income, VAT, and excise), let alone assessment, audit, debt collection, and taxpayer service. Added to these tasks, the international tax agenda, including the BEPS agenda, implementing tax transparency measures, and now the prospect of digital taxation stretches limited resources even further. Digital transformation solutions are designed to automate or digitize systems, reducing the need for human intervention; however, at the same time, higher skill levels are needed to run systems (e.g., for big data management, risk, and taxpayer service). Similar to all limited resources, a choice of how to allocate scarce resources would need to be part of the cost-benefit analysis of a digital transformation program.

Lack of capacity on the taxpayer side is also an issue, especially in developing countries, resulting in low levels of compliance (especially with more complicated instruments, such as VAT).

2. Technological depth and absorption

Developing countries face two different but related types of challenges. First, the tax administration itself may be starting at a low level of technological use (and digital maturity) due to many possible reasons (funding,

²⁸ Haque, Knight, and Jayasurya (2015) argue that although most countries face limits on capacity, smaller and poorer developing countries perform weakest in public financial management and tend to use outmoded techniques. Also see Haque et al. 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.

capacity, strategic priority, or vision). Or, and related to the second issue, it could be that the taxpayer does not, or cannot, use technological solutions to, for example, e-file returns, invoices, or stream data due again to many possible reasons (possibly including financial resources, capacity, prioritization, or even lack of infrastructure—internet). Thus, even if the tax administration decides to undergo digital transformation, it may be that the source of data (the taxpayer) may not be equipped to participate. Part of the journey would need to include ensuring that taxpayers could participate in the data streaming process.

3. Availability and accessibility of data

Related to both capacity and technology is the issue of data availability and access. Tax administrations of the future will be powered by data, and an important driver of efficiency is the ability of a tax administration to use different sources of data as they relate to taxpayers (e.g., beyond tax and invoice filing, banking information, customs information, third-party information for profiling, and adjudicating arms-length pricing). The scarcity of data in developing countries is a common problem due to compliance issues, administration issues, and even technological issues (the inability to receive, store, and/or protect data).

4. Governance and transparency

Governance and transparency issues are a challenge in all contexts; however, for developing countries, it is one of the most serious challenges to compliance and hence revenue generation.²⁹ As in the challenges listed above, digital transformation is aimed at increasing transparency and strengthening governance through “seamless” compliance (data streaming in real time) by design. However, designing or strengthening procedures and tax treatment around good governance, compliance, and transparency in process are essential for a successful transformation journey.

Getting Ready for Digital Transformation

Given the challenges and risks facing developing countries in tax administration, in general, what are the prospects of them successfully implementing and benefiting from a digital transformation?

1. Context, vision, and commitment

A strong vision and commitment to DRM provide the needed context and objectives for tax administration evolution. In addition, tax administration transformation will need to reflect tax policy instruments, so all the components of the DRM plan and the MTRS need to be compatible.

If a developing country seeks to transform its tax administration into a digitalized system, it needs to start by being clear (as for all economies) how far it wants to go on the digital transformation journey. Depending on the country’s starting point, the vision would need to include transformation of the taxpayer alongside the tax administration (people, technology, for example; see the next section for more details). Alongside vision, commitment by both the tax administration and the taxpayer is needed to ensure that the project finishes at the desired state.

²⁹ For a discussion of tax and good governance in developing countries, see OECD. 2011. Tax and Good Governance. *OECD Journal: General Papers*. 2010(1). pp. 69-76.

As mentioned above, funding commitment (*ex-ante*) is also essential for digital transformation, regardless of whether it is financed by own resources or through a donor. Experience from systemic tax administration modernization programs (World Bank) suggests that government commitment to see the project through, combined with funding commitments for the entire project (as opposed to pieces of the project) were key indicators of success.³⁰

2. Scope

After vision, the scope of a digital transformation program in a developing country would need to be mindful of the scope, including stages to get from start to finish. The scope of the project, determining the gap between the baseline and the finish line would need to include steps to bring in and transform the way the taxpayer interacts with the tax administration, and the technology the taxpayer would need to enable streaming real-time data (if that is the endpoint). As noted above, this part of the process could involve substantial infrastructure investments (to strengthen internet penetration), alongside all of the changes needed to move the tax administration to the endpoint.

3. Time

It follows that if a developing country starts with more challenges than a developed country, the time to completion would be longer as well, which would need to be acknowledged from the outset. A longer timeframe would correspond to a longer path from baseline to endpoint, not only in terms of steps but also in terms of ensuring capacity building keeps up with the deployment of technology and new processes. It is also likely that the parallel journey by taxpayers would require longer time to ensure that the infrastructure was in place and to adopt new compliance technologies.

A cost-benefit analysis of a low capacity, developing country digital tax administration journey suggests that the benefits outweigh the cost or risks, so long as the risks are considered and mitigated to the best extent possible. As many of the objectives for digital transformation of tax administration address the fundamental issues faced by developing countries (e.g., inability to use data, cumbersome processes, and unequal treatment of taxpayers), a digital solution to tax administration could benefit both the tax administration and the taxpayer. The challenges and risks suggest that those involved in planning and funding need to consider the following views:

- The vision and expectations for the new system should be realistic and correspond to both the objectives and the unique environment on the ground in country.
- The future state may take longer to reach, more resources.
- The future state may be reached in steps rather than all at once.
- Commitment and governance are key components of a successful journey.

The following section details a digital road map process, which offers an approach to planning and monitoring a digital tax administration transformation journey.

³⁰ World Bank, Independent Evaluation Group. 2017. *Tax Revenue Mobilization—Lessons from the World Bank Group Support for Tax Reform*. <https://ieg.worldbankgroup.org/sites/default/files/Data/reports/lp-taxrevenue-03152017.pdf>. p. 33.

4. Strategic planning and data or information collection: basic assessment framework

The digitization journey should begin with a deep and wide assessment of the current (baseline) situation, and coupled with the strategic vision (endpoint), the policymaker can build out the implementation plan (the digital road map). The basic assessment framework includes the following areas:

- statistics and data gathering (economy and tax administration KPIs);
- policy framework: legal reform needed (access rights, information exchange, data protection, etc.); institutional reform, and institutional maturity assessment;
- governance assessment;
- process framework;
- technology inventory;
- capacity assessment; and
- resources planning (budget and people).

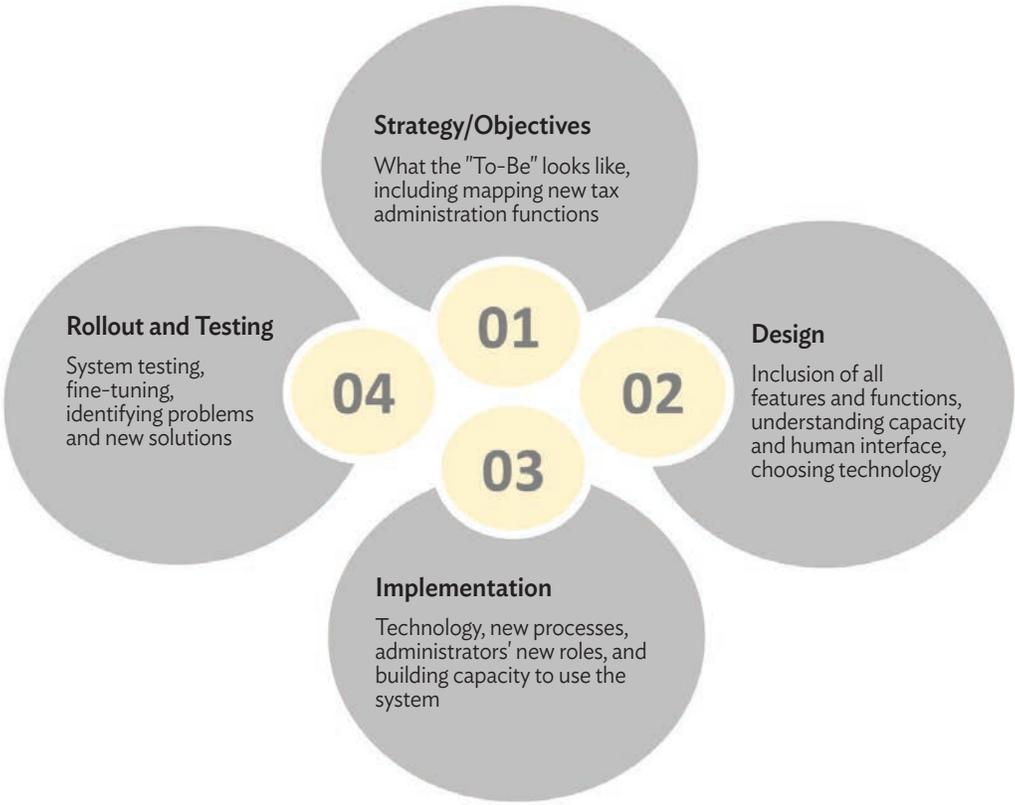
Appendix 2 sketches out a model basic assessment framework.

Road Map for ADB Members

The purpose of a digital transformation road map (DTR) is to provide organization, coordination, and a structured planning tool for digital transformation. It provides a mechanism to ensure that the various workstreams are coordinated, especially as they move at different speeds.

Figure 12: Summary of a Digital Transformation Road Map

A Digital Transformation Road Map is a blueprint for transformation, and looks like this:



Source: Asian Development Bank.

Principles of Design

1. **Technology strategy and road map:** To achieve the vision, it is important to map out the current technology landscape and formulate the technology strategy for the coming 2–5 years. This will help direct the resources to focus the right initiatives at the right times. It also helps map out the dependencies at each stage. Without a clear road map, technology will be implemented in silos (see the Road Map section).
2. **Future skillsets:** It is important for tax authorities to plan ahead to build capacity to be deployed to support the future operation of the digitalized tax administration, for example, data scientists for analyzing the data collected by tax administrations. New talent with an innovative mind enables catalyzing new ideas and embrace the latest emerging technology.

At the same time, capacity building, in general, is a major component of a digital transformation journey. It is critical to provide sufficient education and training, thus enabling the existing staff to be ready to move forward to the next stage.

3. **Stakeholder involvement:** All transformation initiatives require intensive user involvement. In this connection, the earlier the involvement of the stakeholders, the earlier they understand the reason for change, contribute their vision and requirements to the changes and get prepared to embrace the initiative upon rollout.
4. **Change management:** Usually, the vast majority of taxpayers would be affected by a robust transformation, and hence, internal change management and public support are equally essential for success.

Workstreams

Construction of a digital road map involves sequencing the main interconnected workstreams to ensure that all reach the launch level simultaneously. The main interconnected workstreams are as follows:

- **People** (capacity development, organization, and roles);
- **Procedures and Process** (defining the data journey and customer journey);
- **Content** (understanding what information needs to be collected and made available, in what form, and in what context); and
- **Technology** (the technological underpinnings of the tax administration: the engine of all activities).

The **People** stream focuses on determining skills needed to operate the various systems, including management, and ensuring that the staff have sufficient capacity as the time of rollout. Identifying the skillsets needed involves understanding the objectives, functions, and requirements of the other three workstreams.

The **Procedures and Process** stream operationalizes the functions of the tax administration and defines the day-to-day activities performed. Procedures and processes are designed from the objectives and outputs and have an impact on the choice and use of technology. Processes and procedures must be designed with the people (administrators and taxpayers) interface in mind.

The **Content** stream determines the actual inputs and outputs, and focuses on managing taxpayer data and information, as well as taxpayer service content, ensuring that the information is continuously updated, always searchable, able to be customized, and adaptive. The content helps determine how information is organized. Content and the Procedures and Process workstreams must develop hand in hand.

The **Technology** stream, the backbone of the system, ensures that there is strong information infrastructure, from which the function is built, and it serves as a foundation for integrating data across areas. It also serves as the integrator and facilitator of all the information management platforms to be connected and activates predictive data analytics that drive precision, accuracy, and speed. The technology strategy incorporates hardware, software, and information science. The ability to customize and personalize information is critical for structuring data and content while tagging them with the appropriate metadata for defining relationships between classes of information.

Steps along the Road

1. Understanding the endpoint. Where do you want to be?

High level:

- What is the strategic endpoint?
- What is the data concept? (What is the expectation that a data-driven tax administration will achieve?)
- What is the taxpayer assistance concept?
- What functions do you envisage the digitally transformed tax administration to perform?
- What expanded roles will the digitally transformed tax administration encompass?

Specifics:

- What are the specifications and capacities envisaged (e.g., in data handling–level and functionality)?

2. Mapping and understanding the baseline

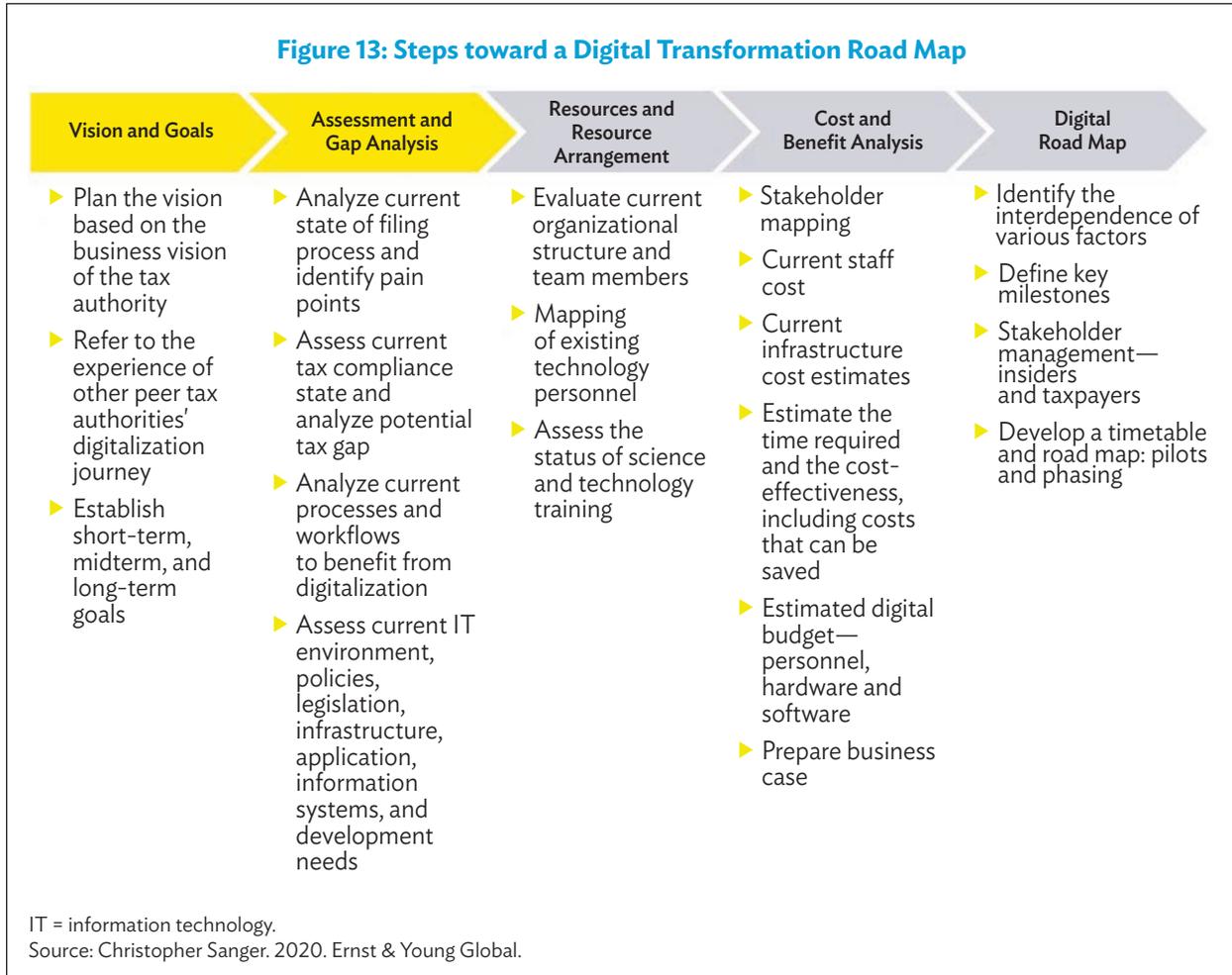
Mapping and understanding the baseline involve an assessment and documentation process, followed by a gap analysis. As a first step, it is important to undertake a digital maturity assessment to capture the baseline and articulate the “To-Be” objectives.

To map accurately, a thorough analysis of the baseline is essential:

- For the **People** stream, assess current skills and capacity, and then compare state people needs and qualifications with the “To-Be” model.
- For the **Procedures and Process** stream, assess and map the current business processes and procedures, compare the baseline both to the outputs (current and “To-Be”) and determine which must be changed or updated, discarded, or recreated based on the “To-Be” model.
- For the **Content** stream, categorize the current inputs (e.g., taxpayer registration information) and outputs (e.g., risk assessment).
- For the **Technology** stream, inventory the current technology, hardware and software, system specifications, and add-ons.

3. Build the road map steps

Build the road map steps by undertaking a gap analysis between the current baseline and the “To-Be” state and identify processes and milestones along the way.



Conclusions

Improving the functions of tax administration is an essential pillar of a government's domestic resource mobilization (DRM) plan and should be a key component in implementing a medium-term revenue strategy (MTRS). Until recently, efficiency gains in tax administration were incremental and depended more on manual compliance management strategies, along with computerization. The advent of new technologies, expansion of information and data, and renewed thinking regarding the fundamentals behind tax processes have allowed new technology to be deployed to support new ways of administering tax. They have also underscored the role of tax administration as a key to accelerating DRM.

Most tax administrations have embraced the idea that adopting a “tax administration of the future” approach, (based on big data flows, continuous access to taxpayer and transaction-based data, and use of advanced technology to make all functions faster, more efficient, and more effective), will enhance taxpayer compliance and satisfaction while realizing MTRS and DRM goals. The fact that most tax authorities in Asia and the Pacific have embarked on some level of digitization (in most cases, e-registration and e-filing, with many jurisdictions adopting e-invoicing and data matching, and a few moving toward a Tax Administration 3.0 model) suggests that digitization of tax administration has taken root and is evolving in the region (see Sanger, Figure 7).

At the same time, each administration in the region differs in their digital transformation journey to date and their appetite. Although there are common overall objectives and standardized phases and endpoints, each transition is different due to a multitude of factors, including the baseline, availability of infrastructure to support a digital transformation, capacity of the tax administration, and taxpayers. Other factors are also important, such as political realities, economic conditions, and social and cultural priorities. All of these components need to be considered when contemplating a digital transformation journey.

Although the path and endpoints in a movement from today's tax administration to the tax administration of the future may differ, there is a clear set of steps and issues in planning, designing, and executing a digital transformation journey, including:

- strategic planning and visioning, bearing in mind the gap between goals and what is possible at the outset;
- decisions on design and phasing (how far and how fast);
- translating planning into implementation: the construction of a digital road map that contains all components of change management, including building capacity; and
- implementation, review, and redesign.

The process described in this study is one of the important components of achieving MTRS objectives, along with a tax policy reform strategy and road map. Digital transformation of tax administration would also necessitate rethinking of tax policy design—in particular, the interfaces used to transmit data (e.g., transmission of VAT data at the transaction point via a digitized cash register or online record of the transaction). This demonstrates that digital transformation of tax administration spills over into the entire DRM system.

Appendix 1

Emerging Technology Trends

Although each digital transformation journey is unique, depending on the baseline, end-state objectives, resources, etc., the following specific types of technological groups are commonly used.

1. Capturing big data

Having the ability to house a large volume and variety of data, tax authorities are able to quickly verify trends and anomalies and respond to discrepancies between forecasted returns and actuals. Some of the benefits include more effective risk-based audit selection, individual and sector-based taxpayer profiling, enhanced outlier-based detection, and improved workflow analysis to identify opportunities for efficiency gains.

2. Data analytics

Data analytics is a broad term covering the autonomous examination of data or content using sophisticated techniques, as well as tools that support forecasts or generate recommendations. There are four types of data analytics: descriptive, diagnostic, predictive, and prescriptive. Each type can support a tax administration to derive a greater value from big datasets, identify existing or future issues and mitigate them quickly. Data analytic techniques are typically used in risk filtering, assessment, and audit. Implementing data-intelligent technology can help tax auditors with predictive modeling for investigating errors and fraud or predictive analytics for risk evaluation (e.g., on VAT refund claims for nonresidents). Benefits therefore include the ability to:

- obtain a multidimensional snapshot of a taxpayer by accessing, combining, and analyzing data from large datasets;
- detect fraud by integrating taxpayer data with Social Network Analysis;¹ and
- create e-learning platforms to identify new, unknown types of risk and interesting or anomalous patterns in data, detect and remediate errors for filing and payment compliance.

Offer risk modeling and data analysis to identify cases and/or taxpayers likely to be flagged:

- Auditing: Tax administrations can create profiles benchmarking by sector and taxpayer segments through large and integrated datasets, create options, and assess the next-best alternative, analyze social networks, or predict unreported income.

¹ Social Network Analysis is an analytical approach to detecting fraud by correlating people, entities, and relationships to determine how tightly an individual or business is related to others who have known compliance issues. Data to determine these relationships can come from social media, shared phone numbers, physical addresses, bank accounts, credit cards, or any other connection that is available through data capture. The results of the Social Network Analysis can show the risk that a specific individual or business presents, based on their relationship with others who have known issues within the network.

- Filing and payment compliance: The combination of large data sets, enhanced risk modeling and procedures, data analytics, combined with augmented taxpayer services, provides both sticks and carrots to boost taxpayer compliance rates.
- Debt management: Data analytics applied to debt can apply to companies that fail to pay.
- Policy evaluation: Tax administrations can better measure tax gaps or assess the impact of policy changes.
- Taxpayer size and sector segmentation: Tax administrations can identify groups based on similarities on set criteria or predict response to intervention.²
- Advanced data analytics: Advanced data analytics are applied from registration to objections, including identifying non-registration, errors on tax return data, identify tax audit cases, predict tax payment default cases, and so on.

3. Digital identity

A single authentication “passport” enables a wide range of functions on both the taxpayer and government sides. It enables a secure, single interface for all government transactions. On the government side, creating a single identifier for a person across all government entities facilitates functions ranging from advanced profiling, risk functions, to audit techniques and could link a taxpayer in good standing to government services. The use of digital identity also enhances the overall taxpayer’s experience when using tax authorities’ digital services.

As part of Singapore’s Smart Nation journey initiative, a NDI system for Singapore residents (SingPass) and business (CorpPass) were deployed to provide a direct interface between the government and private sector in a seamless and secure manner. The use of NDI enabled the collection of data from other agencies and partners (e.g., donation and provident fund) to provide seamless and personalized services for Singapore taxpayers.

4. Data processing tools

Processing tools enable information stored in different formats to be integrated and standardized in a consistent format for further use. For example, data derived from taxpayer reported data, typically captured through documents in XML or JSON formats, can be integrated with the transactional processes of voluntary compliance in a pre-filled tax form.

5. Cloud computing

Cloud platforms, designed to be flexible and scalable, enable tax administrations to collect huge volumes of data in different formats over multiple channels and electronic capture processes. This collection generally comes via two routes: taxpayer reception services on the cloud and data fed from on-premises solutions (for highly sensitive information).

The shared use of data storage, computational algorithms, and application software facilitates the creation of data-rich profiles and can strengthen tax administration capabilities in multiple functions simultaneously by allowing all users of a system access to live information held online. Access can be controlled so that cloud computing is limited to individuals or open to the public. Cloud computing access can also be focused on a

² Microsoft/PWC. 2018. *The Data Intelligent Tax Administration: Meeting the Challenges of Big Tax Data Analytics*. <https://www.pwc.nl/nl/assets/documents/the-data-intelligent-tax-administration-whitepaper.pdf>. p.13.

particular community, which can be beneficial to tax authorities who may want to tailor their services to certain segments of taxpayers.

Cloud computing also facilitates different forms of service provision. It allows tax authorities to provide software as a service to users over the cloud, offer access to platforms for certain stakeholders, or offer their own infrastructure as a service to others.

6. Data warehousing

Data warehousing platforms are a type of storage—secure resources with enormous capacity (it can easily store trillions of files of all different kinds), while making it faster to get up and running with batch, streaming, and interactive analytics. It includes all the capabilities required to help developers and data analysts easily store data of any size, shape, and speed. In addition, people can do all types of processing and analytics across platforms and languages.

7. Artificial intelligence and machine learning

Artificial intelligence is the ability of computers and machines to learn from their own actions and make iterative improvements and efficiency gains to the original processes, as well as continually raise the quality of outputs. In the tax landscape, this affords the ability to better anticipate and mitigate issues. The use of artificial intelligence ranges from taxpayer service to predictive technology for complex audit. For example, some tax administrations use artificial intelligence's natural language processing to offer chatbots, which are able to support taxpayers in overcoming common problems, thus reducing the administrative burden from tax authorities. Artificial intelligence together with predictive analytics can enable the detection of tax gaps, fraud scenarios, and potentially identifying illegal tax behavior.

Tax authorities could identify noncompliance (e.g., mischaracterizing income, underpaying tax, or not paying tax at all) easily by analyzing the tax and financial data of the taxpayers using artificial intelligence and robotics. In addition, artificial intelligence and robotics are often used to automate the manual and repetitive processes, increasing efficiency significantly. Artificial intelligence can also help enhance the accuracy for tax revenue budgeting and forecasting, which can help government to adjust its tax policy.

Furthermore, artificial intelligence analysis on satellite imagery can improve property tax management as they are capable of (i) remotely monitoring property status with minimum or targeted on-site visit survey instead of conducting comprehensive field survey; (ii) providing automatic tracking of changes of property developments with minimum manual investigations; and (iii) reducing risk of human errors and improve institutional integrity.

To this end, two artificial intelligence models are used for producing the building footprint and detecting changes in the status of the building: The building detection model is the first artificial intelligence model, which identifies the location of buildings. If you input one epoch satellite imagery to the building detection model at the middle of the pictures, it produces building detection results. Based on the result, we can produce building footprints as polygons. Using the building footprints, we can identify the locations, numbers, and areas of each building. If we compare the building footprint in two epochs, we may be able to manually identify the change in status of the building. However, again it may be labor intensive and mistakes may happen. Then, the second AI model, change detection model, can classify if a building has changed. If we input two images at the same point but in different epochs, it will show whether these are newly constructed, demolished, rebuilt, or unchanged.

It also enables to create a model of the potential tax yields and to compare the actual property tax revenue with a potential tax revenue, which would support evidence-based policymaking. If there is a significant disparity between them, especially in case the actual revenue is significantly lower than the potential revenue, the fact may be a strong driver for property tax reform. In this regard, ADB conducted pilot projects in Nepal to demonstrate the use of artificial intelligence and satellite imagery for the revenue estimate.

8. Blockchain

Blockchain is a public distributed ledger of network nodes, maintaining a list of registries or transactions gathered in data blocks. Often referred to as double accounting in the web, it features a few key components, including cryptography of private keys, and timestamps allow for each transaction to be logged and traced securely. A consensus mechanism ensures that all parties know what is being tracked. These features mean that a tax authority will be able to see all tax and reimbursement payments made, according to the transaction rules, which can be coded into the blockchain. This allows for rapid and accurate payments and adjustments.

Blockchain technology is commonly used to provide a “single source of truth” of a ledger record, for example, a transaction record for tax administration and reporting. The peer-to-peer distribution network and shared database (or ledger) mean that transactions across multiple entities can be logged. This opens up new areas for collaboration, allowing access to data on a secure basis. It should be noted that the blockchain industry is still in the early stages of development. Some countries are undertaking various proof-of-concept projects to explore the potential use of blockchain technology for their tax administration and regulatory matters.

9. Internet of Things

Tax administrations could potentially use Internet of Things capabilities to track the movement of physical objects (e.g., cargos, goods, and vehicles). This broad term encapsulates the categories of equipment, which embed electronic sensors and software enabled to be tracked online, allowing them to connect and exchange data. Such technology allows tax authorities to generate data for real-time monitoring and measuring services, recognizing patterns and inconsistencies in unstructured data such as claim forms or electronic invoices. Such devices could be used by authorities to expedite tax collection (e.g., cars passing under a sensor are billed for their road tax, and the payment is automatically taken from the user using the blockchain technology with a payment confirmation sent directly to the driver’s phone). It could reduce corporate taxpayers’ compliance burden, especially in indirect tax where mandatory reporting is frequent: VAT, sales tax, as well as for excise duties on consumption and customs. It is important to consider the data privacy policies regarding this type of data.

10. Other advanced technologies

Stream analytics: Usually used in combination with manual audits, stream (continuous data flow) analytics auditing continues to collect data from or about a taxpayer until it triggers a specific business rule, risk flag, threshold, or predefined event or action, in which case it sends a notification to the taxpayer or passes the taxpayer through.³

³ Appendix 1, footnote 1, p. 18.

Appendix 2

Basic Assessment Framework

Launching a digital transformation of tax administration requires policymakers to articulate clearly defined objectives and strategies for the journey, and to set a baseline to define implementation. Thus, careful analysis and planning are the first essential steps and should include a basic assessment of the current foundational frameworks (legal, procedural, capacity, and technological readiness) and have a clear vision of the endpoints (intermediate and final). This basic assessment framework presents the issues and steps needed to be taken to set up a digital tax transformation journey.

Stage	Components or Activities	Outputs	Comments
1. Pre-planning			
A. Objectives and strategy	<p>Objectives</p> <ul style="list-style-type: none"> Is digital tax transformation part of the government's goals? Revenue administration goals? Do the objectives form the mandate for digital transformation? Is digital tax transformation budgeted? <p>Strategy</p> <ul style="list-style-type: none"> Does the revenue administration strategy provide a mandate for digital transformation? If so, does it give guidance about the scope of the journey? 	<ul style="list-style-type: none"> Stakeholder meetings Program, digital transformation strategy, and phasing document 	<ul style="list-style-type: none"> Confirms political ownership of the project Commitment to the digital transformation journey and prioritization of reform program Confirms budget allocation and mechanism
B. Future state planning	<p>Vision</p> <ul style="list-style-type: none"> What does the future state look like (e.g., e-invoicing, e-auditing using predictive technology, distributed ledger use, and continuous data flow)? <p>Phasing</p> <ul style="list-style-type: none"> What approach is to be taken? Phasing? One round? 	<ul style="list-style-type: none"> Stakeholder meetings Program, digital transformation strategy, and phasing document 	<ul style="list-style-type: none"> This exercise sets the "To-Be" state, which can then be used to design a digital road map (implementation plan from "As-Is" to "To-Be" states)

Stage	Components or Activities	Outputs	Comments
2. Establishing a baseline			
A. Basic statistics	Collecting basic revenue statistics: <ul style="list-style-type: none"> • growth rates • tax-to-GDP ratio • tax mix (share of total tax by tax types) • tax gap estimates • basic compliance ratios (e.g., filers-to-registrants ratio) 	<ul style="list-style-type: none"> • Data collected, design of monitoring and evaluation schema • Targets set for the project and outcomes 	<ul style="list-style-type: none"> • Essential to set up monitoring of progress • Sets up the baseline for the evaluation framework
B. Statistics on automation	Statistics that capture the degree of automation: <ul style="list-style-type: none"> • internet penetration • percentage of e-filing of CIT, PIT, and VAT (even PAYE) to total tax return filings • percentage of firms participating in e-invoicing to total firms • percentage of e-audits to total audits • ratio of online payment to total payment 	<ul style="list-style-type: none"> • Data set and analysis of digital tax readiness based on the current use of digital processes 	<ul style="list-style-type: none"> • The statistics will complement the qualitative assessment of the baseline (and stage of digital maturity)
C. Foundations and policy framework	Legal environment <ul style="list-style-type: none"> • Does the existing set of laws and implementing legislation underpinning administration provide the legal foundation for digital tax administration? • Is there sufficient legal foundation for data sharing within the tax administration, between government ministries/ departments/ agencies? Information exchange between agencies: <ul style="list-style-type: none"> • Similarly, is there sufficient legal foundation for access of information, especially from outside government such as the banking system? • Are there any laws/ regulations/ policies/ standards that specify format (data architecture) for exchange of information and data submission? 	For all components, outputs include: <ul style="list-style-type: none"> • diagnostic reports • analysis of “readiness,” identification of key gaps that, which may impact the project Full description of the baseline legal framework As above, gap analysis on internal and external data accessibility	<ul style="list-style-type: none"> • Sets the baseline legal framework to perform a gap analysis to determine where legal and policy reform need to take place to enable the system to operate when implementation is completed • The information exchange step is key to the operation of the DTA system, as it is designed to flag and eliminate barriers to accessing information internally and externally

Stage	Components or Activities	Outputs	Comments
2. Establishing a baseline <i>(continued)</i>			
C. Foundations and policy framework <i>(continued)</i>	<p>Institutional capacity and experience to undergo change management:</p> <ul style="list-style-type: none"> • Does the tax administration have the capacity to undertake a structural transformation program with managerial skills, such as project management? • Does the institution have experience and capacity in procurement? • Does the institution have organizational change management capacity and experience?^a • Is there institutional capacity for changing business processes in line with the “To-Be” system? 		<ul style="list-style-type: none"> • Institutional maturity is also an important diagnostic category as it gives an indication of capacity to change (and if challenges identified, they would be addressed in the digital transformation road map)
D. Processes in place	<ul style="list-style-type: none"> • Are there processes in place and active that govern the management of the DTA project or program? • Is there experience in the adoption of new technology as a part of a project, including processes and procedures for rollout (i.e., capacity building, etc.)? • Is there a process for the preparation, approval, and follow-up of the communications program? Is there a strategy for procurement of consultants?^b 	<ul style="list-style-type: none"> • Process maps, analytical report documenting “As-Is” processes 	<ul style="list-style-type: none"> • Documents baseline, perform a process gap analysis to determine whether any processes can be adapted or new processes need to be developed
E. Technology inventory	<ul style="list-style-type: none"> • Describe the system in place, and where is it deployed. What types of technology are being used and for what purpose? • What are the activities it undertakes now? • Are its components individually effective with respect to stated objectives? • Is the system future proofed, meaning does it have built in expansion and adaptation capabilities, especially to allow for the evolution of information exchange, provision of digital services to the taxpayers, and Big Data analysis? • Is the current digital platform advanced enough to be able to accommodate the technologic change and does it license costs and sufficient technical support from the suppliers to underpin the transformation? 	<ul style="list-style-type: none"> • Inventory, analytical report detailing technology in place and adaptability of current platforms or technology to the future state 	<ul style="list-style-type: none"> • In relation to technology, it is not expected that the baseline technology can be adapted to the end-state form but understanding the technology baseline gives information not only on the technology in use but also gives insight into the existing skillsets and processes

Stage	Components or Activities	Outputs	Comments
2. Establishing a baseline <i>(continued)</i>			
E. Technology inventory <i>(continued)</i>	<ul style="list-style-type: none"> • Is the digital platform expandable to be able to manage increasing volumes and sources of data, while maintaining performance? • Is the software expandable to meet the system’s continuous modernization needs? • Is there any existing infrastructure that can support internet-based taxpayer service functions? • Is the current system web or cloud based? • Can the current system facilitate exchange of information between institutions? • Are the maintenance and updating costs of the computerized platform acceptable? • Is there sufficient documentation to underpin its maintenance? • Describe the data storage and management currently in place (e.g., TIER 3) or similar service in the cloud? • Is there any connectivity between headquarters and district offices? Describe the connectivity and access to information. • Do servers and storage equipment respond to the needs of the tax administration in the short and medium term? • Are the software licenses used in the TIS sufficient to cover the digital expansion?^c 		
F. Capacity assessment	<ul style="list-style-type: none"> • Are ICT human resources sufficient? • What are the capacity-building programs for ICT human resources? • Does the tax authority provide taxpayers with a tax education program? • Does the tax administration have a communication strategy to raise awareness of the use of e-filing and payment? • Are there incentives or strategies for attracting, maintaining, and evaluating people specialized in ICT? 	<ul style="list-style-type: none"> • Analytical report mapping current capacity, detailing capacity gaps 	<ul style="list-style-type: none"> • Sets the baseline and through gap analysis can help define the scope of the capacity-building program, as well as establishing the baseline for taxpayer readiness and experience with digitized processes

Stage	Components or Activities	Outputs	Comments
3. Resource planning			
A. Financial planning	<ul style="list-style-type: none"> • Does the allocated budget fit the scope? • Will the budget allocated be disbursed in tranches (phase planning)? • How is procurement set up? • Are there experts in technology allocated to the procurement team? 	<ul style="list-style-type: none"> • Financing and budgeting resource paper 	<ul style="list-style-type: none"> • Maps financial resources to the project and clarifies what financial resources are secure and which need to be secured
A. Staff planning	<ul style="list-style-type: none"> • Have staff been allocated to all aspects of planning, staging, implementing, and diagnostics? • Do staff need training to do their job currently? • Planning for staff upskilling for post-launch? 	<ul style="list-style-type: none"> • Capacity assessment, capacity gap analysis, and training and upskilling plan 	<ul style="list-style-type: none"> • Maps people to tasks to build accountability for each part of the digital journey, identifies skills needed for the project and post-launch
C. Taxpayer outreach and communications program	<ul style="list-style-type: none"> • Does the tax authority have a communications program and is DTA included? • Has the tax administration assessed taxpayer readiness (technology and process) for digital submission of data (e.g., e-filing, e-invoicing, and data streaming)? 	<ul style="list-style-type: none"> • Communications plan for the implementation and rollout of the new tax administration system • Plan to address taxpayer readiness for DTA (capacity, technological requirements) 	<ul style="list-style-type: none"> • Digital readiness on the taxpayer side is a crucial component in a DTA and to the success of a transformation journey. In addition, a communications program will be an essential piece of the rollout strategy
D. Governance structure	<ul style="list-style-type: none"> • What is the governance structure for the digitization journey? • Is there a supervision team that will be in place for the entire project (from planning to launch)? • Are there any gaps in project oversight? • Identification of the extent to which top government decision makers are actively participating in the planning or approval process, implementation, and rollout. 		<ul style="list-style-type: none"> • Strong governance and accountability are important for a complicated and potentially highly risky project (from a cost and political standpoint). • Participation of top government decision makers is important for ensuring political buy-in for transformation

^a Asian Development Bank. 2014. *Tool Kit for Tax Administration Management Information System*. <https://www.adb.org/sites/default/files/publication/150133/tool-kit-tax-administration-management-information-system.pdf>. p. 36.

^b CIAT. 2020. *ICT as a Strategic Tool to Leapfrog the Efficiency of Tax Administrations*. <https://www.ciat.org/ict-as-a-strategic-tool-to-leapfrog-the-efficiency-of-tax-administrations/?lang=en>. p. 362.

^c Footnote b, p. 361.

Source: Compiled by the Asian Development Bank.

Appendix 3

Relevant Statistical Data

Total ICT Costs as a Share of Total Operating Costs

Region or economy	Total ICT expenditure (million in local currency)		Total operating expenditure (million in local currency)		Total ICT costs as a share of total operating costs (%)	
	2016	2017	2016	2017	2016	2017
<i>Central and West Asia</i>						
Afghanistan	...	...	122	128	...	...
Armenia	329	365	7,152	8,080	4.6	4.5
Azerbaijan	4	7	25	27	16.0	25.9
Georgia	<1	<1	119	119	0.8	0.8
Kazakhstan	...	...	41,585	42,385	...	...
Kyrgyz Republic	9	4	795	858	1.1	0.4
Tajikistan	...	...	...	...	...	...
Uzbekistan	884	902	433,867	474,876	0.2	0.1
<i>East Asia</i>						
China, People's Republic of	685	687	56,111	56,677	1.2	1.2
Hong Kong, China	163	170	1,453	1,504	11.2	11.3
Japan	45,162	47,517	707,351	703,469	6.3	6.7
Korea, Republic of	113,914	120,816	1,540,251	1,600,727	7.3	7.5
Mongolia	197	517	...	...
Taipei, China	544	584	25,212	24,346	2.1	2.3
<i>Pacific</i>						
Australia	746	750	3,460	3,528	21.5	21.2
Fiji	1	1	44	48	2.2	2.0
New Zealand	54	64	747	783	7.2	8.1
Papua New Guinea	7	6	48	51	14.5	11.7
Samoa	<1	<1	5	5	20.0	20.0
Solomon Islands	1	1	6	17	16.6	5.8

Continued on next page

Total ICT Costs as a Share of Total Operating Costs (*continued*)

Region or economy	Total ICT expenditure (million in local currency)		Total operating expenditure (million in local currency)		Total ICT costs as a share of total operating costs (%)	
	2016	2017	2016	2017	2016	2017
<i>South Asia</i>						
Bangladesh	...	...	...	...	...	...
Bhutan	...	...	...	...	...	...
India	5,246	6,661	55,439	60,876	9.4	10.9
Maldives	<1	<1	79	85	1.2	1.1
Sri Lanka	278	233	4,061	4,337	6.8	5.3
<i>Southeast Asia</i>						
Cambodia	8,983	3,763	30,220	70,557	29.7	5.3
Indonesia	258,570	0	13,375,548	14,335,961	1.9	...
Lao PDR	...	...	...	...	...	...
Malaysia	164	217	1,946	2,383	8.4	9.1
Myanmar	383	23	197,435	319,731	0.1	0.0
Philippines	428	439	7,503	10,157	5.7	4.3
Singapore	94	97	374	397	25.1	24.4
Thailand	495	495	8,740	8,771	5.6	5.6
Viet Nam	700,841	879,713	11,617,694	13,762,764	6.0	6.3

... = data not available at cut-off date, FTE = full-time equivalents, ICT = information and communication technology, Lao PDR = Lao People's Democratic Republic.

Sources: CIAT, IOTA, IMF, and OECD. 2018. 2018 International Survey on Revenue Administration (ISORA); ADB. 2016. A Comparative Analysis of Tax Administration in Asia and the Pacific. Manila; and OECD. 2017. Tax Administration 2017: Comparative Information on OECD and Other Advanced and Emerging Economies. Paris: OECD Publishing.

Total Operating Expenditure as a Proportion of Net Revenue Collected (%)

Region or economy	Total costs of tax administration as a proportion of net revenue collected (%)					Factors affecting the comparability of computed ratios
	2013	2014	2015	2016	2017	
<i>Central and West Asia</i>						
Afghanistan	...	0.35	0.36	0.39	0.34	
Armenia	...	...	...	0.93	1.04	
Azerbaijan	...	...	...	0.63	0.41	
Georgia	...	...	...	1.44	1.56	
Kazakhstan	...	0.82	0.86	0.60	0.50	
Kyrgyz Republic	1.78	1.90	1.56	1.23	1.24	
Tajikistan	1.98	...	...	...	...
Uzbekistan	...	...	...	1.04	0.95	

Region or economy	Total costs of tax administration as a proportion of net revenue collected (%)					Factors affecting the comparability of computed ratios
	2013	2014	2015	2016	2017	
<i>East Asia</i>						
China, People's Republic of				0.37	0.32	
Hong Kong, China	0.66	0.58	0.48	0.50	0.52	Ratio excludes excises collected by Customs
Japan	1.74	1.52	1.43	1.34	1.34	Ratio excludes SSC collected separately
Korea, Republic of	0.74	0.77	0.76	0.80	0.74	Ratio excludes SSC collected separately
Mongolia	...	...	...	...	...
Taipei, China	...	1.19	1.15	1.13	1.08	Ratio excludes SSC collected separately
<i>Pacific</i>						
Australia	0.93	0.94 ^a	0.86 ^a	0.86	0.83	
New Zealand	0.85	0.84 ^a	0.79 ^a	0.79	0.76	Ratio excludes excises collected by Customs
Papua New Guinea	0.69	0.65	0.78	0.75	0.73	
Samoa	...	...	...	2.67	2.82	
Solomon Islands	...	...	...	0.34	1.05	
<i>South Asia</i>						
Bangladesh	...	0.08	0.09	...	...
India	...	0.57	0.59	0.75	0.72	Ratio is computed for direct taxes only
Maldives	0.52	0.55	0.61	0.73	0.72	There is no personal income tax
<i>Southeast Asia</i>						
Cambodia	0.35	0.29	0.36	0.50	0.89	Ratio excludes excises collected by Customs
Indonesia	0.56	0.78	1.27	1.21	1.25	Ratio excludes excises collected by Customs
Malaysia	1.00	1.36	1.58	1.71	1.93	Ratio is computed for direct taxes only
Philippines	0.61	0.50	0.48	0.48	0.57	Ratio excludes excises collected by Customs
Singapore	0.79	0.85	0.86	0.84	0.84	Ratio excludes excises collected by Customs
Thailand	0.71	0.82	0.90			Ratio excludes excises and SSC collected separately

... = data not available, SSC = social security contributions.

^a Both these revenue bodies perform extensive nontax roles, the costs of which have not been separately identified by the Organisation for Economic Co-operation and Development (OECD). For comparability, computations, have, therefore been made using prior year cost apportionment ratios from OECD publications—approximately 16% for the Australian Taxation Office and 33% for New Zealand Inland Revenue.

Sources: CIAT, IOTA, IMF, and OECD. 2018. *2018 International Survey on Revenue Administration (ISORA)*; ADB. 2016. *A Comparative Analysis of Tax Administration in Asia and the Pacific*. Manila; OECD. 2017. *Tax Administration 2017: Comparative Information on OECD and Other Advanced and Emerging Economies*. Paris: OECD Publishing; and OECD. 2015. *Tax Administration 2015*. Paris: OECD Publishing.

Appendix 4

Subject Matter Reference Guide

Category	Link	Description
Digital Transformation Road Map	Making Tax Digital: Corporation Tax (publishing.service.gov.uk)	UK example for road map
Digital Transformation Road Map	HMRC's road map for making tax digital Taxation	Comments on UK road map
Digital Transformation Road Map	Road Map | Digital Transformation Agency (dta.gov.au)	Road map example across whole of government
Digital Transformation Road Map	Road Map to the digital tax debate for developing countries | Afronomicslaw	Developing country angle
Digital Transformation Road Map	How to Build a Road Map to Digital Transformation | GE Digital	Guide
Digital Transformation Road Map	Chapter 5. Testing and Implementing Digital Tax Administration : Digital Revolutions in Public Finance: (imf.org)	Practical tips
Digital Transformation Road Map	Digitization_Tax_Administration.pdf (cef-see.org)	Academic commentary
Digital Transformation Road Map	Building a Successful Digital Transformation road Map | Earley Information Science	Definition and guide
Digital Transformation Road Map	A road map for a digital transformation | McKinsey	Definition and guide
Digital Transformation Road Map	What is a Digital Transformation Strategic Road Map? | Jibility	Definition and guide
Digital Transformation Road Map	A Brief Road Map for Digital Transformation: Leveraging Business Architecture to Achieve Superb Results (deloitte.com)	Deloitte example
Digital Transformation Road Map	Road Map to Digital Transformation | IMG (imgcorp.co.uk)	Road Map example
Digital Transformation Road Map	How to create a digital road map (and why you need one) (inviqa.com)	Guide

Category	Link	Description
Future of tax admin	Reimagining tax authorities for the future McKinsey	<p>Summary:</p> <p>Tax authorities could become invisible (as in the FTA vision).</p> <p>Changing economies will have an impact on tax authorities:</p> <ul style="list-style-type: none"> • Cashless economy • Rise of cloud-based SaaS • Gig economy • New tax types <p>COVID-19 is accelerating change.</p> <p>Shifts for tax authorities will be as follows:</p> <ul style="list-style-type: none"> • Transform operating model to look more like a consumer-facing tech company • Workforce—more data and analysis experts • Build positive relationships with citizens • Governments below private sector in terms of tax administration • No trust in personal data <p>Double transformation required—in response to COVID-19 and the digital economy</p>
Future of tax admin	digital-tax.ashx (icaew.com)	Good examples and practical lessons
Future of tax admin	Tax Administration 3.0: The Digital Transformation of Tax Administration (skatteetaten.no)	Latest FTA material
Future of tax admin	Digitization_Tax_Administration.pdf (cef-see.org)	Academic commentary
Future of tax admin	Building a trusted, modern tax administration system - GOV.UK (www.gov.uk)	UK government paper
Future of tax admin	The_Future_of_Taxation_May_2020.pdf (icas.com)	UK Future of Taxation—ICAS paper
Future of tax admin	deloitte-au-ps-building-the-digital-revenue-agency-310120.pdf	Building the digital revenue agency of the future—Deloitte paper
Future of tax admin	White Paper: Tax Administration 2025 (ibm.com)	Tax Administration 2025—IBM paper
Future of tax admin	Digital Transformation of Tax Administration White Paper.pdf (microsoft.com)	Digital transformation of tax administration—Microsoft and PWC paper

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Launching a Digital Tax Administration Transformation

What You Need to Know

This publication provides an overview of issues and areas that policy makers from members of the Asian Development Bank would want to be familiar with when embarking on planning and implementing a digital transformation of tax administration. Key considerations include reasons for undertaking a transformational reform, elements needed to build a strategy and implementation plan (digital road map), risks and challenges, and possible impacts. The report brings together a basic assessment framework to support the initiation of the planning process and an approach to effective implementation of “the tax administration of the future.”

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