

FORUM ON TAX ADMINISTRATION

Supporting the Digitalisation of Developing Country Tax Administrations



Supporting the Digitalisation of Developing Country Tax Administrations

Forum on Tax Administration



This document, as well as any data and any map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

This document was approved by the Committee on Fiscal Affairs on 8 December 2021 and prepared for publication by the OECD Secretariat.

Please cite this publication as:

OECD (2021), *Supporting the Digitalisation of Developing Country Tax Administrations*, Forum on Tax Administration, OECD, Paris.
www.oecd.org/tax/forum-on-tax-administration/publications-and-products/supporting-the-digitalisation-of-developing-country-tax-administrations.htm

Photo credits: © Omelchenko – Shutterstock.com

© OECD 2021

The use of this work, whether digital or print, is governed by the Terms and Conditions to be found at www.oecd.org/termsandconditions

Preface

Tax administrations across the globe are examining the potential benefits of digitalisation for improved taxpayer services and increased revenue. Developing countries are no different, and many are today engaged in building innovative digital solutions to meet 21st century challenges.

It therefore gives us great pleasure to present this joint report on supporting the digitalisation of tax administration in developing countries. Based on the expertise and experience of tax officials from administrations across the world, the report sets out some guidance and insight on how to effectively identify and deliver a digitalisation programme – from developing the strategic vision through to the details of preparing and executing successful projects.

Digitalisation by itself will not solve the difficulties faced by a tax administration, and each tax administration needs to tackle the challenges of digitalisation according to its unique situation, needs and priorities, but learning from the experience of others can significantly improve the effectiveness of a country's digital journey. Not only does the report highlight the wealth of experience that is available for tax administrations to utilise, but it also contains more than 30 examples and cases studies related to digitalisation, including from seven African countries, ensuring that the advice it provides is rooted in practical experience.

By breaking the digitalisation journey into defined stages and illustrating it with practical examples, the report seeks to offer relevant material to different levels within a tax administration. We hope therefore that the report may inspire Commissioners and their colleagues to take bold steps towards digitalisation in their jurisdictions. Even though the challenges may be daunting, the potential for much needed increases in revenue and improvements in taxpayer services, as well as building resilience to shocks such as COVID-19, means that many developing country tax administrations are increasingly thinking about their longer-term digitalisation journeys.

Finally, we would like to thank all tax administration staff involved in producing this engaging and informative report and the ATAF and OECD Secretariats for their work in preparing and drafting it. We would encourage you to circulate this report within your administrations and to provide suggestions for how we can build on it through the development of further supporting materials and networks to help support the digitalisation of tax administrations globally.



Logan Wort
Executive Secretary
African Tax Administration Forum



Pascal Saint Amans
Director of the Centre for Tax Policy and Administration
Organisation for Economic Co-operation and
Development

Foreword

Supporting the Digitalisation of Developing Country Tax Administrations has been produced by the OECD Centre for Tax Policy and Administration in collaboration with the African Tax Administration Forum (ATAF). The primary purpose of the report is to share information that will assist developing country tax administrations as they consider digitalisation, facilitate dialogue among tax officials on tax administration issues, and identify opportunities to improve tax administration ICT systems.

The report has been produced with financial support from the governments of Ireland, Japan, Luxembourg, Norway, Sweden, Switzerland and the United Kingdom. It was developed as part of the set of actions undertaken to support the digital transformation of tax administration following the publication of the 2020 Tax Administration 3.0 report by the OECD Forum on Tax Administration (FTA). This action focuses on capacity building support for the digitalisation of developing country tax administrations. The Advisory and Drafting Group supporting this work is co-chaired by FTA-members Kenya and United Kingdom, and includes Chile, Colombia, Georgia, Italy, Malaysia and Sweden.

The report was drafted by Vegard Holmedahl, Paul Marsh and Peter Green from the FTA Secretariat with input and assistance from Rex Arendsen, Raffaele Articulo, Oliver Petzold, Sonia Nicolas and Nicolas Barra. It has also benefitted substantially from earlier work by Mr. Timo Laukkanen.

The preparation of the report was also assisted by a series of workshops aimed at sourcing information and insights for the report. The workshops were prepared and executed by a team including Ms. Mokgadi Maila and Ms. Varsha Singh from ATAF, Ms. Ana Rodriguez-Calderon and Ms. Weijing Ye from the Global Relations and Development division in the OECD and staff from the FTA Secretariat.

The following regional organisations contributed to Part III of the report: African Tax Administration Forum (ATAF) represented by Ms. Varsha Singh; the Asian Development Bank (ADB) represented by Mr. Daisuke Miura; the Inter-American Center of Tax Administrations (CIAT) represented by Mr. Raul Zambrano; and the Intra-European Organisation of Tax Administrations (IOTA) represented by Ms. Tracey Brooks.

The authors would like to thank tax officials from tax administrations within and outside the FTA as well as researchers and staff from international organisations who have contributed to this report: Mr. Ambrose Bonney, Mr. Derek A. Hill, Mr. Isaac Kobina Amoako, Mr. Thomas O’Kane, Mr. Moses Obulo, Ms. Eileen Rafferty, Mr. Hank Williams, Mr. Stephane Philippe, Mr. Ezera Madzivanyila, Mr. Benson Ong, Ms. Galuh Wardani, Mr. Rubino Sugana, Mr. Sweetbert Soka, Ms. Diana Oviedo, Mr. Chibale Chimambo, Mr. Magnus Andresen, Mr. Simon Muyunga, Mr. Mansoor Sultan, Mr. Odd-Helge Fjeldstad, Mr. Dom O’Connell, Mr. Richard Stern, Mr. Jean-Louis Kaliningondo, Ms. Mercy Kihui, Mr. Moses Misach Kajubi, Mr. Anders Agerskov, Mr. Ziyaad Butler, Mr. Nicolas Penagos, Mr. Michael Roekaerts, Ms. Gladys Kitony, Ms. Benjaporn Jitburut, Mr. Henrik Lund, Ms. Stina Farje, Mr. Tommy Carlsson, Mr. Andreas Voxberg, Mr. Eric Thoren, Mr. Jonas Raneke, Mr. Bjarni Sigurdsson, Mr. Agron Thaqi, Ms. Helene de Faire, Ms. Nune Khachatryan, Mr. John-Paul Fanning, Mr. Arsen Aldanov, Ms. Evelyn Khoo, Ms. Yi Qing Soh, Ms. Hui Yan Au, Ms. Cinzia Castelli, Mr. Samson Uridia, Mr. David Chitaishvili, Mr. Dachi Kinkladze, Mr. Georg Geberth, Mr. Michael Tobai, Mr. Mats Flaten, Ms. Catherine Keül, Ms. Liv Marte Kristiansen Nordhaug.

Table of contents

Preface	3
Foreword	4
Readers' guide	8
Abbreviations	10
Executive summary	12
Part I. Opportunities for digitalisation	16
1 Why digitalise a tax administration?	17
Drivers for change	18
The importance of leadership	18
Developing a vision for digitalisation	19
Rationale for digitalisation	20
Overcoming potential barriers to change	29
Final words	31
Part II. Digitalisation journey guidance	33
2 Context Analysis	35
Common factors for external analysis	36
Common factors for internal analysis	42
From vision via detailed analysis back to the big picture	44
3 Creating a digitalisation strategy	45
Common elements of a digitalisation strategy	46
4 Managing strategy-aligned projects	56
Choosing the project manager	57
Preparing project scope and governance	57
Preparing the project plan	63
Preparing for change	63
Preparing for roll-out	65
Project execution	66
Post-project follow-up and monitoring	67

Part III. Examples and assistance	68
5 Frequently digitalised areas	71
Taxpayer registry and identity solutions	73
Integrated tax systems	82
Comprehensive taxpayer communication solutions	87
Taxpayer service solutions	92
Compliance risk management	100
Business administration systems	114
Using Analytics in tax administrations	115
Considering synergy effects	119
6 Regional characteristics and assistance opportunities	121
African Tax Administration Forum (ATAF) viewpoints	122
Asian Development Bank (ADB) viewpoints	124
Inter-American Center of Tax Administrations (CIAT) viewpoints	126
Intra-European Organisation of Tax Administrations (IOTA) viewpoints	128
Summarising regional viewpoints	130
7 Internationally developed tools, frameworks and offerings	131
Tax Administration Diagnostic Assessment Tool (TADAT)	132
Medium Term Revenue Strategy (MTRS) formulation and implementation	134
Tax DIAMOND	135
International Survey on Revenue Administration (ISORA)	136
OECD Tax administration Maturity Models	138
Peer-to-peer assistance related to digitalisation	140
Definitions	143
References	145
Annex A. Observations on the context analysis process	153
Common tools and methods for analysing external factors	154
Common tools and methods for analysing internal factors	158
Annex B. Observations on the digitalisation strategy process	160
Drafting the objectives	161
Performing a gap analysis	161
Drafting digitalisation deliverables	162
Performing a cost-benefit analysis	163
Performing risk analysis	164
Performing estimation and drafting remaining parts	164
Performing stakeholder consultations	165
Draft revision and approval	166
Annex C. Observations on managing successful digitalisation projects	167
Observations related to project planning	168
Common project manager tasks during project preparation	171
Common project manager tasks during project execution	175

Annex D. Observations related to ICT solutions and software development	178
Choosing core ICT solution architecture	179
Software development	183

FIGURES

Figure 1.1. Years of Adoption of e-Invoicing in Latin America	22
Figure 1.2. Kazakhstan risk management system and monitoring	24
Figure 1.3. Impact of administrative burden on entrepreneurial activity	25
Figure 1.4. Adults without bank accounts in 2017	31
Figure 2.1. Common factors to consider during context analysis	36
Figure 2.2. Common stakeholder groups	37
Figure 2.3. Armenia: example of data exchange with other entities	38
Figure 2.4. Common compliance and taxpayer burden issue areas	39
Figure 3.1. Common characteristics of successful digitalisation strategies	45
Figure 3.2. Common elements of a digitalisation strategy	47
Figure 3.3. Suggested key figures related to transparency measures	54
Figure 4.1. Common activities for managing digitalisation projects	56
Figure 4.2. Common project mandate topics	59
Figure 4.3. Software used for operational ICT solutions	60
Figure 5.1. Areas frequently targeted for digitalisation	72
Figure 5.2. Example of Singapore's electronic and mobile payment ecosystem	95
Figure 5.3. Upstream and downstream compliance and risk management	101
Figure 7.1. MTRS Interdependent components	134
Figure 7.2. Examples of possible benefits from digitalisation	164
Figure A.1. Summary of common tools and methods for analysis	154

TABLES

Table 4.1. Some common characteristics of Build, Buy, Rent	61
Table 5.1. Common benefits of using Analytics in tax administrations	116

Readers' guide

Report structure

The report examines the common elements of successful digitalisation journeys, and the benefits they deliver. It is not intended as a 'how to' guide, as the individual circumstances of an administration should dictate the most appropriate solutions and approaches. Instead it uses insight and examples supplied by tax administrations to highlight important success factors, recent innovations, examples of good practice, and key learning.

The main body of the publication is structured around three parts, each with a different purpose and audience. Whilst this report can be read through in full, it is also designed so that each part can be read relatively independently by different audiences.

- **Part I** considers the motivation for tax administration digitalisation, and aims to inspire the thinking of Commissioners and management teams who are building the case for digitalisation.
- **Part II** examines the common stages of successful digitalisation journeys, to guide managers, project managers and teams involved in planning digitalisation projects. The report also contains four annexes which provide more detail on the topics discussed in Part II.
- **Part III** identifies frequently targeted digitalisation areas and key learning from successful projects, supported by case studies from tax administrations across the world. This part also examines where further support and guidance is available. Managers, project managers and teams involved in planning and executing digitalisation projects may find this part helpful as they examine the implementation of digital projects.

Research and drafting process

A wide ranging process was used to gain the insight that is contained within this report. Twenty nine tax administrations worldwide as well as staff from international organisations and research institutions have contributed to the report. The process included, among other work:

- Interviews with expert staff involved in tax administration digitalisation projects. These interviews have also formed the basis for some of the case studies and examples that can be found in this report.
- Workshops that explored the challenges, issues and opportunities for digitalisation of developing country tax administrations. On average, the workshops were attended by around 100 participants. Contributions to the workshops came from Australia, Belgium, Canada, Chile, Costa Rica, Ghana, Jamaica, Kenya, Liberia, Norway, Pakistan, Singapore, Uganda, UK, and Zambia as well as ATAF, CIAT and WBG. The workshop covered the following topics:
 - a. Overview of the digitalisation journey (Including societal considerations and the digital landscape).
 - b. Two digitalisation journey aspects: Stakeholders and Using Analytics

- c. Financial aspects of the digitalisation journey
 - d. Using the Digital Transformation Maturity Model.
- An extensive revision process, to which the following FTA members contributed: Australia, Chile, Colombia, Denmark, Finland, France, Georgia, Kenya, Ireland, Italy, Malaysia, Mexico, Norway, Singapore, Sweden and United Kingdom.

The authors are very grateful for the significant amount of time that contributors have given to support the development of the report.

Caveat

Tax administrations operate in varied environments, and the way in which they each administer their taxation system differs in respect to their policy and legislative environment and their administrative practice and culture. As such, a standard approach to tax administration may be neither practical nor desirable in a particular instance. Therefore, this report and the observations it makes need to be interpreted with this in mind. Care should be taken when considering a country's practices to fully appreciate the complex factors that have shaped a particular approach. Similarly, regard needs to be had to the distinct challenges and priorities each administration is managing.

Abbreviations

ADB	Asian Development Bank
API	Application Programming Interface
ATAF	Africa Tax Administration Forum
B2B	Business-to-business
B2C	Business-to-consumer
BYOD	bring-your-own-device
CIAT	Centro Interamericano de Administraciones Tributarias (Inter-American Center of Tax Administrations)
COTS	commercial-off-the-shelf
CRM	Customer Relation Management
DevOps	Development and Operations
ERP	Enterprise Resource Planning
FTA	Forum on Tax Administration
HNWI	High net wealth individual
ICT	Information and communication technology
IMF	International Monetary Fund
IOTA	Intra-European Organisation of Tax Administrations
ISORA	International Survey on Revenue Administration
ICT	Information technology
MAPS	Methodology for Assessing Procurement Systems
MNE	Multinational enterprise
MOSIP	Modular Open Source Identity Platform
MTRS	Medium Term Revenue Strategy
MVP	Minimum Viable Product
OCR	Online cash register
OECD	Organisation for Economic Co-operation and Development
OSS	Open source software
PAYE	Pay-as-you-earn
PCT	Platform for Collaboration on Tax
PIT	Personal income tax
POC	Proof of concept
RPA	Robotics Process Automation

SaaS	Software-as-a-Service
SME	Small and medium enterprise
SOA	Service Oriented Architecture
TADAT	Tax Administration Diagnostic Assessment Tool
Tax DIAMOND	Development of Implementation and Monitoring Directives for tax reform
UN	United Nations
USSD	Unstructured Supplementary Service Data
VITARA	Virtual Training to Advance Revenue Administration
WBG	World Bank Group
WBS	Work breakdown structure

Executive summary

Digital technology has changed and continues to change many aspects of daily life, including the way customers interact with businesses and complete transactions and the way people and businesses communicate with each other. These developments have also changed expectations, in particular assumptions around being able to transact quickly and seamlessly at any time of the day or night and increasingly across borders.

The changes are also revolutionising the operating models of tax administrations. They are opening up opportunities for more effective and efficient ways for the administrations to raise the revenue that is needed to fund public services as well as often reducing the administrative burden for taxpayers, which can bring substantial economic benefits.

The first part of this report, which focuses on the opportunities and challenges facing developing countries undertaking digitalisation, identifies that underpinning all successful digitalisation work are two key foundations:

- The administration has a clear and defined vision for digitalisation that is articulated across the organisation and fits with political priorities. This brings a sense of common purpose to the work, which helps the tax administration as a whole support the vision.
- Senior leaders in the administration fully support the digitalisation journey, and lead effectively by motivating their teams to meet the inevitable challenges. Effective leadership is vital as competing priorities are balanced and difficult decisions are taken. It is also essential that leaders are flexible and open to change as projects evolve, so that the pathway to digitalisation is adjusted as necessary.

With these foundations in place, tax administrations are well placed to realise the potential gains from digitalisation. Analysis for the first part of the report has identified that tax administrations in developing countries may gain benefits from digitalisation in four key areas:

- It may increase revenue by expanding the tax base or through more effective collection.
- It may increase efficiency and effectiveness through simplifying processes, using cheaper and more accessible digital channels to interact with taxpayers, moving to more self-service approaches, and effectively exploiting data to focus resources more effectively.
- It may reduce taxpayers' administrative burdens by making it easier to comply with obligations, in some cases by building taxation processes into the processes they use in their everyday lives and businesses.
- It may help to drive profound and significant changes in society. Tax administration touches many aspects of a society as one of the largest government functions, and the drive towards a digital tax administration can help increase wider digitalisation across government and across society. In turn this can open up new opportunities for economic growth.

Technological barriers, in particular lack of widespread internet access and lack of access to digital financial services, have previously prevented some administrations from embracing digital opportunities in

full. After all, if taxpayers do not have access to a reliable Internet connection and a way to make payments electronically easily and cheaply, a digital tax administration will fail. However, recent changes in mobile technology is reducing these barriers. Greater availability of reliable wireless internet, often through mobile phones, means that access to the internet is increasingly widespread in developing countries. This is coupled with the growth of new mobile-based electronic payment services, so that opportunities for digital payments are available to many more taxpayers, which is particularly useful for those who do not have a traditional bank account. This growth in mobile technology, and the applications that it allows, is creating a window of opportunity that tax administrations can utilise to make significant progress along their digital journeys.

As a result, many developing country administrations are embarking on new digital journeys, something that was given increased momentum by the COVID-19 pandemic which forced administrations and governments to increase the use of technology to interact with taxpayers and, in many cases, to help provide financial support.

The second part of this report draws on the experiences of tax administrations across the globe, to identify common elements of successful digitalisation projects and share observations related to potential pitfalls. Although the journey of each tax administration is unique, material collected for this report shows that successful digitalisation journeys typically go through three main stages. These stages are:

- Context analysis. This is critical as it helps ensure that the right opportunities and challenges for digitalisation are uncovered depending on a jurisdiction's unique circumstances. This analysis will normally encompass factors *external* to the tax administration like compliance issues or digital adoption in society, as well as factors concerning the *internal* capability of the tax administration to address the opportunities and challenges.
- Strategy development. Using the context analysis, the administration can develop a digitalisation strategy that will guide the rest of the journey. With a digitalisation strategy describing the overall *vision and objectives* for digitalisation, *deliverables* that will contribute to fulfilling the objectives, the *timeline* along which the deliverables should be realised, and the plan for *financing* the work, the administration can inspire and motivate stakeholders while also managing expectations about the scope and timing of benefits.
- Successful project delivery. To fulfil the objectives of the strategy, the administration will need to execute a set of strategy-aligned and coordinated digitalisation projects. While successful project results partly hinge on adherence to the digitalisation strategy, they also require a foundation of careful project preparation, including scoping, governance and mandate questions; flexible and professional project execution supported by top management; and thorough post-project follow-up of deliverables and benefits.

While each tax administration needs to tackle the challenges of digitalisation according to its individual situation, needs and priorities, administrations are clear that learning from the experience of others significantly aids their individual journey. This may for instance come through specific expertise within a particular area, by providing a different perspective on issues, to help challenge existing ways of thinking, accelerate work and avoid common pitfalls.

The third part of the report therefore presents information from different sources of such expertise. It starts by focusing on what is often the most valuable source of assistance – learning from the experience of other tax administrations in frequently targeted areas of digitalisation. Thanks to the input of tax administrations across the globe, the report describes a set of frequently targeted areas of digitalisation that over time can come together and interlock to form a digitalised tax administration.

Supported by case studies and key learning, the areas are:

- Taxpayer registry and identity, providing a secure gateway and foundation for a digital tax administration;

- Integrated tax systems, connecting the different parts of a tax administration to deliver holistic taxpayer processes;
- Taxpayer communication, delivering effective communication channels of greater availability;
- Taxpayer service, helping to reduce the administrative burdens for taxpayers;
- Compliance and risk management, making it cheaper and easier to comply, more difficult not to, and more easily detectable by the administration when noncompliance occurs;
- Business administration systems, improving the internal functioning of the tax administration; and
- Analytics, offering insight into opportunities and challenges across the administration.

In addition to their intrinsic value in enhancing the efficiency and effectiveness of tax administration, these projects also lay the groundwork for complete digital transformation of tax processes, where compliance to tax law becomes built in to society's financial systems, making compliance effortless and noncompliance increasingly difficult. Furthermore, developing country tax administrations that undertake digitalisation projects may wish to keep the future vision of a transformed administration in mind, identifying opportunities where they are unencumbered by previous processes to leapfrog stages of digitalisation, and lay the building blocks of more seamless future tax administration while benefiting from current digitalisation measures.

In addition to the tax administrations themselves, there are several organisations who can provide external expertise and support. Regional tax organisations can provide insight into the specific challenges of a region, which can be valuable as they can give advice that takes into account specific local requirements. Several regional bodies have analysed the extent of tax administration digitalisation in their region and outline opportunities for regionally based support in the third part of this report.

There are also various internationally developed offerings which can help tax administrations gain insight into their current strengths and weaknesses. They can also offer additional perspectives on the context in which tax administrations operate, identify potential strategic objectives for digitalisation and supply digitalisation assistance. The offerings range from assessment tools and surveys to peer-to-peer assistance, and the third part of the report also contains a brief summary of some of these offerings.

Though digitalisation is not a panacea that solves all the problems a tax administration faces, it can help tax administrations fulfil their core purpose more effectively and efficiently. The clear message of this entire report is therefore that developing country tax administrations should be thinking about their digitalisation journeys now, even if the journey may seem daunting.

Next steps

This report highlights the key areas that tax administrations may wish to consider when planning their digitalisation journey as well as the width and depth of expertise that is available to support them. However, the report has necessary limitations, as it intentionally only provides an overview of the key issues rather than a deep exploration of the myriad of issues involved.

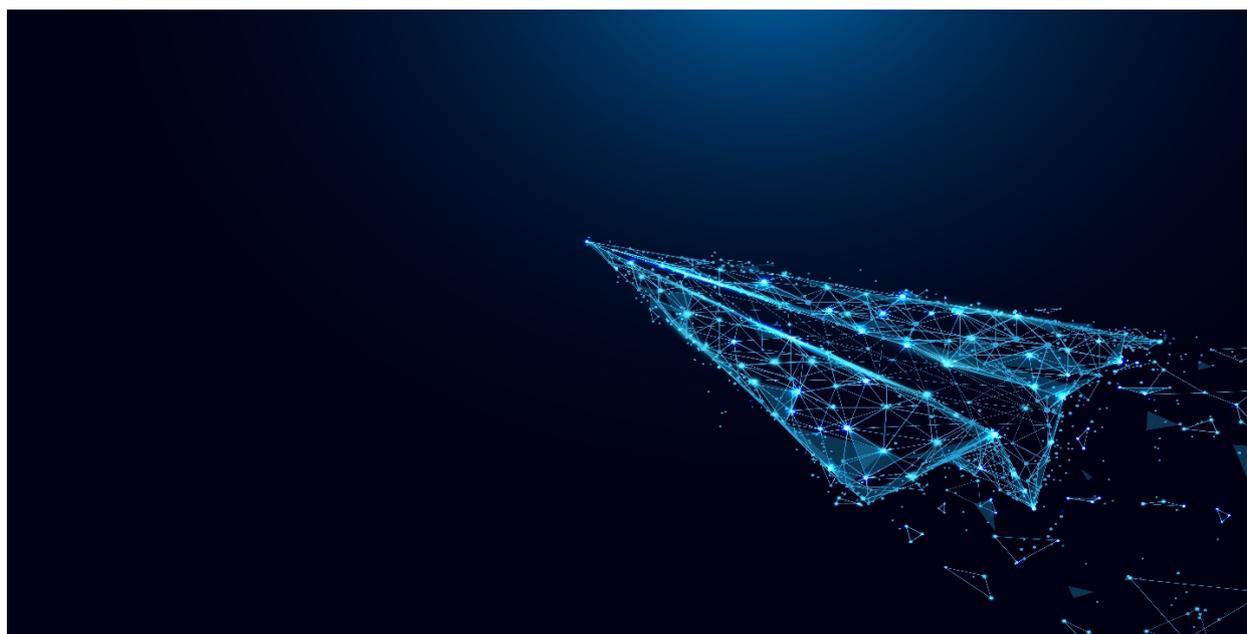
That deeper advice is often best provided through peer-to-peer engagement; and the report highlights the importance of collaboration between tax administrations to share experience, and in particular the critical role that leadership has to play in delivering successful digital outcomes. To achieve these outcomes requires close interactions between administrations and other partners.

The number of tax administrations engaged in digitalisation journeys is increasing, so the need for interactions will continue and increase. In order to support developing country tax administrations in their digitalisation journeys, in addition to the project support provided bilaterally by countries and international organisations, next steps could therefore include:

- Discussions with developing country tax administrations and other stakeholders on where the production of further annexes or guides providing a more detailed examination of specific aspects of the digitalisation journey might be of most value.
- Development of a mechanism to provide peer-to-peer confidential support to senior leaders on the strategic challenges they will need to address to achieve successful digitalisation journeys.
- Facilitating the use of the new digital transformation maturity model described in this report which allows administrations to self-assess their current level of maturity and can be a helpful tool in planning further steps in the digital transformation journey.
- Building an inventory of digital innovations together with a repository of case studies, to share knowledge and help jurisdictions to identify possible options that may work in their circumstances.
- Establishing networks or forums on some of the key enablers of digitalisation, such as data management, digital identity and human resources, to facilitate the sharing of experiences between developed and developing tax administrations.
- Exploring opportunities for online learning related to tax administration digitalisation topics in particular, complementing the existing offers related to tax administration training in general.

Part I. Opportunities for digitalisation

1 Why digitalise a tax administration?



Every tax administration has to find its own solutions to the challenges of digitalisation.

The resources available to a government and how it spends them on public services are central to the well-being of a society. Taxation has a critical role to play in providing those resources, and is one of the primary tools at a government's disposal to guide and manage the development of a country, enabling the delivery of better outcomes for citizens.

The rapid evolution of digital technologies brings opportunities for new ways to achieve this goal. Digitalisation offers prospects to revolutionise the way that a tax administration communicates with taxpayers and processes information. In turn this can facilitate new operating models that can make tax systems more accessible, efficient and seamless for both taxpayer and administration.

Whilst technology creates opportunities, it also creates challenges, for instance as disruptive digital business practices can change taxpayer expectations about how they interact with an organisation, and the speed and ease with which they can make transactions.

It is important to recognise that digitalisation of a tax administration is not a linear process, where the administration completes predefined steps in a particular order to achieve a described outcome. On the contrary, the digitalisation journey a tax administration follows depends on its unique starting point and individual priorities. It is also important to recognise that digitalisation is not a 'cure-all' that can solve all an administrations problems.

Every tax administration therefore has to find its own solutions to the challenges of digitalisation. Some start with small projects to build experience and over time combine the results of these projects into a wider digitalisation initiative, while others identify particular taxes or customer groups as a focus for digitalisation, and apply a digitalisation strategy to the chosen target areas.

The purpose of this report is therefore not to provide a prescribed formula for delivering successful digitalisation projects. Instead it draws on the experiences of tax administrations across the globe, and the many different approaches taken, to identify some core elements of successful digitalisation projects, with a particular emphasis on developing country circumstances.

Drivers for change

The growth of the digital economy and changes in technology are providing challenges to the existing operational models of a tax administration as well as creating opportunities for new ones. These challenges and opportunities stem from disruptive digital business practices that change taxpayer expectations about how they interact with an organisation, and the speed and ease with which they can make transactions.

These new approaches are providing drivers for change within tax administrations that cannot be ignored. Whilst embracing the opportunities of digitalisation depends on the circumstances within each country, and there will be institutional and budgetary challenges which will need to be overcome, these should not distract from starting on a digitalisation journey. If tax administrations do not move with the digital trend, they risk their core purpose of remaining an efficient and effective source of revenue for governments.

The importance of leadership

The most consistent feedback from those involved in successful digitalisation projects relates to the importance of effective leadership from senior officials. Interviews with tax administration officials and capacity building organisations conducted for this report consistently describe lack of management ownership as the most common cause of struggling projects, and that clear support for digitalisation from the senior leaders of the tax administration is a prerequisite for a successful project. Whilst the leadership styles may vary, successful digitalisation projects typically shared the following traits amongst their senior leaders:

- **Pro-active staff motivation.** Digitalisation projects can be challenging. Without active leadership to encourage the staff and support them through challenges, the digitalisation efforts may fail regardless of the skills of the project team. Sustained motivation and willingness to change is key, and leaders need to inspire their staff to deliver according to the vision and objectives, including through consistent messaging, engagement and objective setting. This usually requires that the leader demonstrates personal ownership of the digitalisation strategy and change processes; a leader that believes that the digitalisation vision is both achievable and desirable for the administration is much more likely to receive the enthusiastic backing necessary for success.
- **Effective governance.** The leadership needs to be involved in robust governance arrangements, ensuring there is sufficient oversight for core issues such as effective risk management. Most importantly there needs to be clear decision making, allowing staff to focus on the work that needs to be done.
- **Clarity on the challenges.** Digitalisation can risk being seen, by staff and taxpayers alike, as a universal remedy that can effortlessly solve all known problems. Managing expectations of success and when this success is likely to materialise will help maintain the necessary momentum of projects. This is vital during those periods, which are bound to come, when progress is less smooth than planned.

- **Being a good role model.** The changes that come with digitalisation often demand flexibility and openness to new solutions and may require adapting to new or changed work processes. As digitalisation can be a relatively new topic, it is important for the tax administration to consider the level of digital skills in its leadership teams, to ensure that they have the insight necessary to lead the digitalisation journey. Tax administrations report that mentoring and skill sharing between staff and leaders of different administrations often proves to be a very effective way to bridge skill gaps. Leaders that demonstrate their enthusiasm for acquiring new skills, show willingness to learn from mistakes, and are ready to adapt approaches in the face of new challenges or insight, are more likely to succeed with their digitalisation projects.

Developing a vision for digitalisation

Before embarking on a digitalisation journey, time should be spent considering why the tax administration should go through a digitalisation process, the strategic vision for the journey and how it fits into the wider vision of the tax administration and its role in society in general.

A core part of effective leadership is developing a shared sense of purpose or vision to guide and motivate staff and managers. This principle also holds in the context of tax administration digitalisation. The vision needs to be owned and driven by senior leaders of the administration who may be acutely aware of some of the ‘big picture’ challenges that are likely to hold back the administration from delivering on its mandate, including where administrative burdens are impacting on taxpayers, and so be able to identify areas where digitalisation could have an impact. The vision can also be driven by wider political imperatives, which might have set challenging targets for increased revenue, greater efficiencies in administration or a wider drive for greater digitalisation across government and society.

Therefore, before embarking on a digitalisation journey, time should be spent considering *why* the tax administration should go through a digitalisation process, the strategic vision for the journey and how it fits into the wider vision of the tax administration and its role in society in general. Through this, the tax administration can give a clear message to staff and taxpayers on the ambitions of the digitalisation work.

Box 1.1. exemplifies the process from vision to reality in a digitalisation context.

Box 1.1. Chile: Digitalisation vision for improving VAT compliance

The Chilean Tax Administration (Servicio de Impuestos Internos, or SII) has a long-term strategy to improve VAT compliance, as it is the main consumption tax in Chile. The first step in this strategy was to allow for the electronic issuance of invoices in B2B transactions, and in 2003, large taxpayers were authorised to issue invoices electronically, together with the Electronic Book of Purchases and Sales.

Following on from this in 2007, in order to support micro, small and medium-sized enterprises (Mipyme), the SII created a free Electronic Invoice Mipyme Portal, in collaboration with Mipyme associations and with financial contribution from the Inter-American Development Bank (IDB). This allowed Mipyme businesses to benefit from electronic invoicing just like larger enterprises.

Over the years, the issuance of other VAT related tax documents have also been implemented electronically, including credit notes, debit notes, and export invoices.

In 2014, a major boost was given to electronic invoicing, when the law established that within three years it would be mandatory for all taxpayers. There were different timelines for implementation according to the size and Internet access of taxpayers, with the only exception being those taxpayers located in areas without electricity or Internet, or who were in an area declared as a disaster area, due to being affected by a natural disaster such as an earthquake.

The impact of this was significant. In 2014, 10% of taxpayers issued their invoices electronically, covering 60% of total invoices; and by 2020, 100% of taxpayers issued their invoices electronically. This process also made it possible, as of August 2017, to offer taxpayers a pre-filled Purchase and Sales Register, which they had to review and supplement with sales made with other types of documents that were still kept on paper. This Register is the basis for the preparation of the VAT Return Proposal, which was also made available electronically as of August 2017. Finally, from January 2021, taxpayers are obliged by law to issue sales and services receipts electronically (i.e. invoices in B2C transactions), meaning that the SII has all the necessary information to prepare the VAT Return, except for those who are exempted for reasons mentioned above.

This has allowed SII to substantially increase VAT compliance, as well as other VAT obligations. Thus, as of December 2017, 84% of the total VAT paid was using the pre-filled Form, and one year later (December 2018), 91% of the total VAT paid was made using the pre-filled Form.

Source: E-mail from Chilean Tax Administration (SII), October 2021.

Rationale for digitalisation

Digitalisation of the economy is creating drivers for change within tax administrations that cannot be ignored. Whilst it is important to recognise that embracing the opportunities of digitalisation depends on the circumstances within each country, and there will be institutional and budgetary challenges which will need to be overcome, these should not distract from starting on a digitalisation journey.

If tax administrations do not move with the digital trend, they risk their core purpose of remaining an efficient and effective source of revenue for governments. However, digitalisation also brings with new opportunities to fulfil this core purpose in new and innovative ways that can provide:

- Opportunities for increasing revenue
- Opportunities for greater efficiency and effectiveness
- Opportunities to reduce burdens on taxpayers
- Opportunities to drive wider change.

Opportunities for increasing revenue

Tax administrations have a vital role to play in securing the domestic revenues that support a country's development, and securing those revenues in a way that is equitable, balanced and with a low administrative burden is amongst the core goals of any tax administration. This helps grow perceptions of fairness, which in turn creates a compliance culture which is crucial as long as tax administrations largely depend on voluntary taxpayer compliance. Digitalisation creates opportunities for tax administrations to approach these goals in new ways, and the data that is gathered about taxpayers can give greater insight into new and improved compliance approaches. In turn, this insight can be used to build the evidence base for future policy decisions that can both broaden the tax base and reduce the room for non-compliance.

Many of these opportunities can lie in tackling the problems of the hidden and informal economy. The 2018 International Labour Organisation report on the informal economy found that more than two thirds of the employed population in emerging and developing countries are in informal employment. (ILO, 2018^[1]) Not only does this significantly impact on the individual who, being informally employed, can find it harder to access government services, but it also usually reduces the ability of the tax administration to tax this income. Although some sectors of the informal economy are exempt from taxation by national legislation, other sectors are hidden from taxation by the employers or the self-employed, leading to reduced taxation and social security contributions and creating unfair competition compared with those who comply.

Digitalisation offers opportunities to tackle these issues, for instance by creating digital links between employers and tax administrations for withholding regimes, and by embedding tax reporting systems into the growing platform economy.¹ The recently established *OECD Model Rules for Reporting by Platform Operators with respect to Sellers in the Sharing and Gig Economy*, (OECD, 2020^[2]) set out a framework for how tax administrations and platforms can exchange data on a cross border basis. Additionally, the *OECD Code of Conduct* (OECD, 2020^[3]), published by the Forum on Tax Administration, is intended to supplement the Model Reporting Rules by facilitating a possible standard approach to domestic co-operation between administrations and platforms. As these systems grow, tax administrations can work with the platforms to enhance tax compliance of their users and to reduce burdens, including potentially building tax processes within the systems used by the platforms. The opportunities are explored in more detail in the OECD report on *The Sharing and Gig Economy: Effective Taxation of Platform Sellers* (OECD, 2019^[4]).

Much of the hidden economy relies on cash transactions, and as the report *Shining Light on the Shadow Economy: Opportunities and threats* (OECD, 2017^[5]) sets out, digitalisation can also have positive impact on compliance rates by regularising this. For example, electronic invoicing creates digital links between businesses and tax administration by allowing sales to be reported automatically to the administration. This can significantly improve the collection rates of sales taxes and reduce the cost of compliance monitoring. In turn this can improve the trust-relationship between tax administration and taxpayers and further increase compliance rates. Such solutions also increase the quality and usually the granularity of the information used of taxation, and can contribute to innovative solutions such as prefilling VAT forms, which reduces the administrative burden on taxpayers as well as reducing reporting errors. As Figure 1.1. shows, electronic invoicing approaches have been widely adopted in Latin America.

¹ As the term indicates, the platform economy is the growing economy based on interaction between workers and customers through a digital platform, disrupting traditional employer-employee structures.

Figure 1.1. Years of adoption of e-invoicing in Latin America



Source: (CIAT, 2020^[6])

Digitalisation has the potential to give a tax administration greater insight into the activity of taxpayers, allowing tax administrations to signpost the compliance route for a taxpayer. Tax administrations also develop more taxpayer centric approaches that use data to pre-populate tax returns, reducing the scope for error. By using the data that digitalisation provides, tax administrations can move towards compliance by design², leading to increased revenue for the government.

² Compliance by design implies that ICT systems involved in taxation functions are designed in such a manner that compliance is built into the systems; when taxpayers meet their tax obligations seamlessly, the need for downstream compliance verification is reduced.

Opportunities for greater efficiency and effectiveness

Common effectiveness and efficiency goals include simplifying processes, reducing unnecessary interaction between taxpayer and tax administration and using data to join-up internal tax administration processes and to improve risk assessments.

Whilst digitalisation can bring opportunities for increased revenue, it can also bring opportunities to increase the efficiency and effectiveness of the tax administration, which can benefit both taxpayers and the administration itself. This is often a core objective of digitalisation projects, as it can help reduce costs for all parties, allowing precious resources to be focussed on other priority areas. Common goals in this regard include simplifying processes, reducing unnecessary interaction between taxpayer and tax administration and using data to join-up internal tax administration processes and to improve risk assessments.

There are many examples of digitalisation projects, both small and large, that have helped drive greater efficiency and effectiveness in tax administration. Some of these changes are brought about by moving from partially paper-based to primarily computer-based interaction between taxpayer and administration. This can improve taxpayer service by allowing taxpayers to input data direct into tax administration systems, reducing errors and increasing speed of service. This also reduces tax administration costs and can reduce errors which is often a significant driver of non-compliance.

Much can also be achieved by changing the mix of taxpayer service channels by using data to improve the effectiveness of the customer relationship tools, through either greater personalisation or more efficient 'self-service' channels. This can permit the shift from more labour intensive channels like in-person appointments and call centres to more efficient and arguably more customer-friendly channels like 24-hour chat-bots. These can reduce costs for all parties by allowing simpler transactions to be completed more efficiently, which can in turn drive improved taxpayer satisfaction.

This does not necessarily mean that the more labour intensive channels can be removed, but capacity can be freed up to assist where they deliver greatest impact, for example helping taxpayers with more complex matters. Digitalisation allows the use of new innovative approaches to deliver tax messages to previously hard to reach groups in new and innovative ways.

Taxpayer service can also be improved by shifting from reactive communication, relying on taxpayers contacting the administration, to the tax administration proactively contacting taxpayers using relatively low cost channels such as SMS. The style and content of the communication can build on behavioural science techniques to 'nudge' taxpayers at opportune times and guide them along a journey to greater compliance; using communication pro-actively in this manner can both reduce compliance costs and drive up compliance rates. Box 1.2. exemplifies such techniques and the results. The proactive communication service can be complemented with relatively low-cost communication via social media to reach an even larger range of taxpayers.

Box 1.2. FTA members: Using behavioural insight to encourage tax compliance

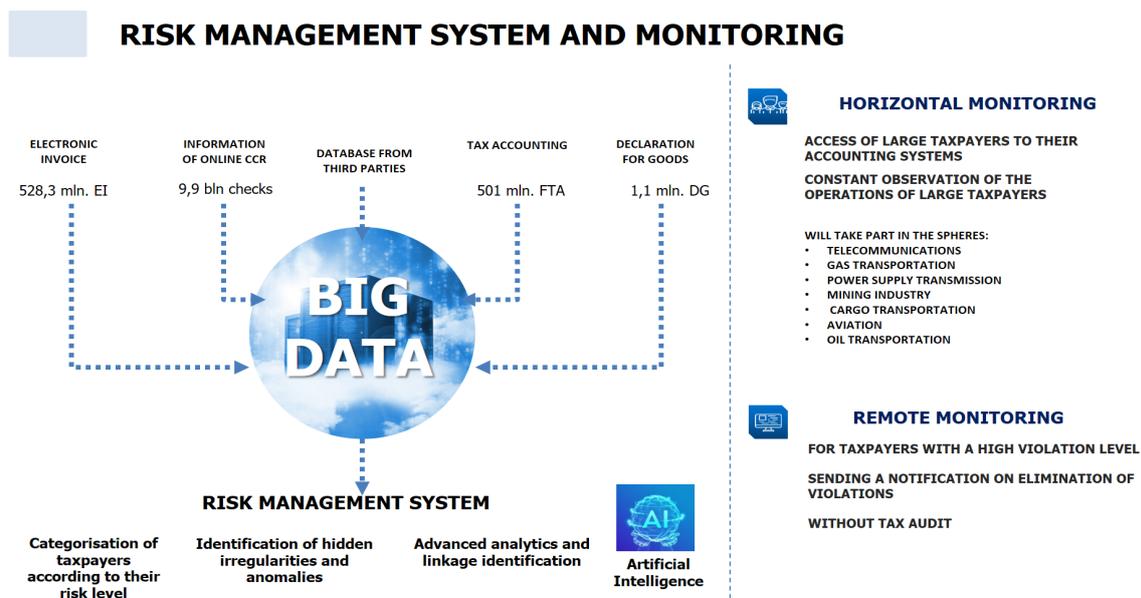
Results from a survey conducted among FTA members show that the use of *behavioural insight* helped administrations:

- “Reduce the number of taxpayers owing taxes through behaviourally informed changes to processes, by as much as 33%
- Improve timely personal income tax payments with low-cost changes to communications, significantly increasing revenues collected and debts prevented
- Reduce misreporting of income and expenses through tailored digital prompts
- Reduce improper payments of benefits to ineligible taxpayers
- Increase voluntary disclosures and reporting of wealth by as much as 30%
- Increase filing among prior non-filers by as much as 15%
- Increase self-service and online actions by more than 20%”

Source: (OECD, 2021^[7]).

Digitalisation also gives tax administrations access to large pools of data that may have been previously unavailable for practical reasons (like only being available on paper). Tax administrations can consider investing in developing Analytics solutions that can help increase the efficiency and effectiveness of risking processes as well as other areas of tax administration. Figure 1.2. provides an example of the wide range of sources that can be used in such analysis. Analytics also offers opportunities for improvement in a range of other areas such as providing greater insight into the policy making processes and identifying patterns to gain early indicators of non-compliance.

Figure 1.2. Kazakhstan risk management system and monitoring



6

Note: See also presentation from Kazakhstan State Revenue Committee: <https://oecd.org/tax/forum-on-tax-administration/publications-and-products/Kazakhstan-tax-presentation.pdf>.

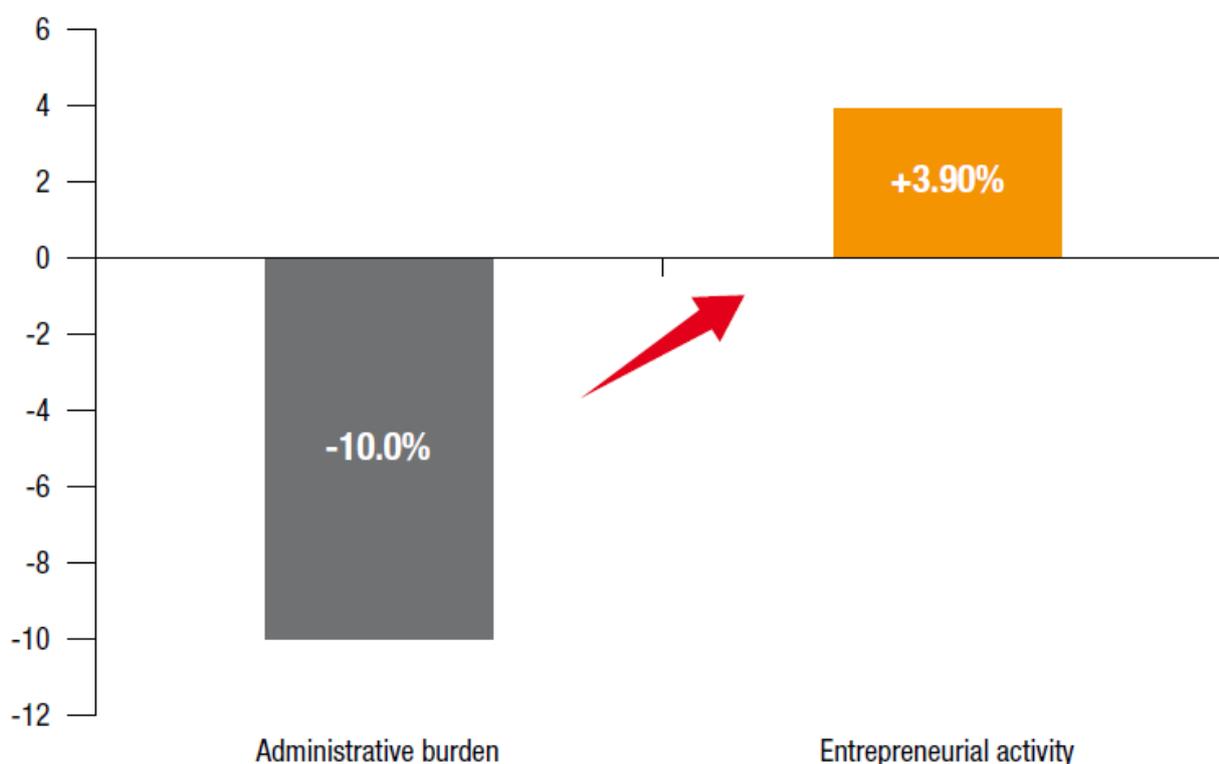
Source: Kazakhstan State Revenue Committee, December 2020.

Opportunities to reduce burdens on taxpayers

A 10% reduction in tax administration burdens can lead to an increase of nearly 4% in entrepreneurial activity.

Current tax administration systems can often place heavy administrative burdens on taxpayers. Businesses and citizens may have to comply with a range of obligations, and as Figure 1.3. from the OECD report *Tax Administration 3.0: The Digital Transformation of Tax Administration* shows, this can have significant impact on entrepreneurial activity, with a 10% reduction in tax administration burdens leading to an increase of nearly 4% in entrepreneurial activity.

Figure 1.3. Impact of administrative burden on entrepreneurial activity



Source: (OECD, 2020^[8])

Tax administrations largely rely on taxpayers to make the right compliance choices as to the reporting, calculation and payment of tax. These choices are not just whether or not to comply, but also include the effort made in order to get everything right, such as record keeping, taking the time to fill in forms correctly, resolving any lack of understanding and meeting reporting requirements and deadlines. Taxpayers often balance the compliance burden against the risks of non-compliance.

The effects of these choices can be compounded by compliance verification often being a “downstream” activity. Information from the calculation, reporting and payment of tax is subject to verification checks within the administration, and when risks are identified, or in some cases through random selection, tax audits are conducted. The downstream nature of compliance verification can lead to tax uncertainty, with

implications for taxpayers around financial planning, cash-flow management and investment, as well as the additional costs and time consumption of verification processes.

Digitalisation offers an opportunity to address some of the structural limitations of traditional tax administration processes, by moving away from sequential taxpayer-facing processes and beginning to integrate taxation at the time of the transaction triggering a taxation event, often embedded in the systems used by taxpayers as part of their daily lives and businesses, sometimes called natural systems. By embedding tax within taxpayer natural systems, paying taxes can become a more seamless experience which can facilitate “tax just happening”.

Such integration will allow for compliance by design, meaning that non-compliance becomes increasingly a deliberate action requiring burdensome additional activities by the taxpayer. For those that are compliant it also offers possible step-change reductions in compliance costs. This helps change the balance of risk equation in taxpayers’ minds by raising the risks of being caught and reducing the burden of being compliant.

To facilitate this new approach, tax administrations can:

- Develop libraries of application programming interfaces (APIs)³ which can be used to transfer information between the taxpayer’s natural systems and the appropriate tax administration systems.
- Design electronic taxpayer services that are embedded into taxpayer’s natural systems, such as withholding.
- Work with third party software providers to embed tax functionality into software, to ensure that taxpayer information is provided to the tax administration in formats that are certain to be accepted.

Box 1.3 exemplifies how Chile has combined compliance by design through electronic invoicing with a taxpayer service that makes it easier to comply; the administration offers a free smartphone app for managing the electronic invoice processes.

³ See Annex D for more information on APIs.

Box 1.3. Chile: E-invoicing via smartphone app

Electronic invoicing for goods and services became mandatory in Chile in January 2021. To simplify adaptation for taxpayers, the tax administration (SII) offered a free smartphone app. By mid-February 2021, 74% of the taxpayers mandated to use electronic invoicing used the app provided by the administration.



Note: See also <https://www.sii.cl/ayudas/apps/efactura/index.html>

Source: SII Workshop presentation February 2021: <https://oecd.org/tax/forum-on-tax-administration/publications-and-products/Chile-User-Experience-Feb2021.pdf> .

Opportunities to drive wider change within society

Public sector digitalisation can often provide the impetus for the creation of digital eco systems, by building infrastructure and driving digital adoption through digital service delivery.

Digitalisation often leads to the creation of new digital eco-systems that can help interdependent digital technologies thrive and grow, contributing to commercial growth and new opportunities for citizens. Public sector digitalisation can often provide the impetus for the creation of digital eco systems, by building infrastructure and driving digital adoption through digital service delivery. Governments are uniquely placed to provide the leadership and institutional capabilities to push forward digitalisation agendas across a country. This often involves aligning policies across government, making government digital capabilities more widely accessible, and considering how public-private partnership can be used to maximise return on investment.

Governments often also play a leading role in driving digital literacy by supporting education about digital services among citizens and providing the legal and regulatory framework that allows for building trust in

digital services. All this demands sound managerial and technical skills, and leadership within institutions to support and encourage a thriving digital economy.

Tax administrations can play a lead role in this development of the wider digital economy, as they frequently interact with citizens as representatives of the government. The leadership that a tax administration shows in embracing digitalisation can help familiarise governments with the concept of digital interaction and help provide the skills base for wider government work. Box 1.4. shows an example of a cross-governmental initiative making it easier for taxpayers to pay their dues. Additionally, the systems that a tax administration builds as part of its digitalisation journey can be reused or expanded to create foundations and deliverables for other government departments to leverage, and help foster the wider digital ecosystem. By opening up digital government services to business, these systems can also provide the foundation for private sector growth and innovation. For instance, based on secure information transfer between government and individuals, private sector organisations may be able to enhance their own services, and in turn build trust amongst citizens that digital transactions are secure.

Box 1.4. Ghana: Common government payment platform

Ghana.gov is a digital service and revenue collection platform, created to provide a single point of access to Government of Ghana services for the public sector.

The portal allows the public to make the following payment types online:

- Card Payments
- Mobile Money Payments
- Internet Banking Payments

Source: Workshop presentation from the Ghana Revenue Authority, February 2021: <https://oecd.org/tax/forum-on-tax-administration/publications-and-products/Ghana-Digitalisation-Journey.pdf>.

A good example of how digital infrastructure can support wider government work and the private sector is in the creation of digital identity systems. These are frequently at the foundation of national digitalisation processes as they provide a secure way for an individual to verify their identity to an organisation before accessing confidential services. Similarly, identity solutions developed by a tax administration can be used across government as the foundation for other digital services, or reach across into private enterprise where sectors such as financial services can benefit from governmentally verified identity data to support their services.

By taking the lead on digitalisation projects, tax administrations can fulfil a dual role in their country. Not only can they collect the revenue to fund public services, they can also provide the foundations for a wider digital journey of a country. This can spur new growth within the economy, as the tax administration encourages new digital skills among citizens and creates frameworks for digital businesses to grow and thrive. By embracing new digitally based compliance techniques, the tax administration can help level the playing field between legitimate businesses and those who have operated in the hidden economy. New digital skills among citizens, growing digital businesses and fair competition between businesses can create a virtuous circle of growth, bringing wider economic benefits to a nation.

Overcoming potential barriers to change

These digital opportunities can have a transformative effect on a tax administration, making a significant positive impact for the citizens of the country they serve. Whilst there are many examples of tax administrations in developing countries successfully deploying digital solutions, this report has identified some common stages that, unless adequately handled, may introduce barriers to desired changes from digitalisation. These are addressed in a subsequent part of this report and include:

- Understanding the complex landscape in which a tax administration operates, and how digital projects impact that landscape. This landscape can include analysis of external factors and stakeholders, as well as the internal capability and drivers of the tax administration.
- Building a comprehensive, and sustainable digitalisation strategy, that can guide the digitalisation work, and provide a common focus across the tax administration.
- Enhancing the capability of the tax administration to implement digitalisation projects, so that the many different strands are effectively managed to deliver results as intended.

Furthermore, interviews and research undertaken for this report shows that two issues have often been barriers to the wider adoption of digital services:

1. Lack of widespread access to a reliable internet connection that has sufficient bandwidth and stability to deliver taxpayer services.
2. Lack of widespread access to banking services that facilitate efficient and affordable electronic money transfer between taxpayer and tax administration.

Without these foundational systems, mass adoption of digital taxation services is almost impossible. However, changes in technology mean that there are growing opportunities to adapt approaches and find new solutions to overcome structural weaknesses, in particular through the use of mobile technologies and tools.

Barrier 1 – Lack of widespread internet access

For many parts of the world this has been a substantial and consistent barrier to the wider adoption of digital services. A significant factor in the past has been the lack of infrastructure that can be used for wired broadband services, which contributes to why the International Telecommunications Union (ITU) has estimated that in 2020, developing countries have 12 fixed broadband subscriptions per 100 people, almost 3 times less than developed countries. (International Telecommunications Union, 2020^[9])

In the past, tax administrations have developed innovative workarounds to this lack of access. Some countries have enabled local internet café owners to assist taxpayers, others have legislated agents with internet access to support taxpayers, others again have created mobile service centres – like the mobile revenue service centres in Georgia through which taxpayers can receive services in regions where there are no offices.⁴ (Georgia Revenue Service, 2019^[10])

However, the rapid adoption of *mobile broadband* means that more and more people in developing countries are gaining internet access, with the ITU estimating that in developing countries in 2020, there are 65 active mobile broadband subscriptions per 100 inhabitants (International Telecommunications Union, 2020^[9]) Driven by infrastructure investment and falling prices, this is projected to continue to grow

⁴ The mobile service centres are known as RS-cars. As of 2020, 73 percent of Georgia's population has access to internet (<https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=GE> and <https://www.itu.int/en/ITU-D/Statistics/Documents/bigdata/Georgia.pdf>). However, RS-Cars are still in demand in areas where there are no permanent service centres, and some taxpayers prefer face-to-face communication with tax officials.

rapidly, with for example sub Saharan Africa forecast to see mobile internet use almost double by 2025. (GSMA, 2021^[11])

This growth in the penetration of mobile internet provides opportunities for developing country tax administrations to embrace the opportunities that mobile broadband can bring and develop services based on this infrastructure. Of course, the use of mobile platforms means that the cost of mobile data use and the screen size need to be taken into account when designing digital solutions. Consequently, digital projects for mobile devices need to be selected carefully, and administrations may choose to start digitalisation projects in specific and limited areas to help build taxpayer acceptance and expertise and to develop their own learning through evaluation and feedback.

Over time though, these projects can build into a wider digitalisation programme as the experience of running digital projects within the administration grows, and the wider use of mobile services spreads in society. There are also opportunities, as experience increases, to skip stages of the digital journey that have been completed by others – so called “leapfrogging” - where there are no or fewer constraints, for instance due to legacy systems.

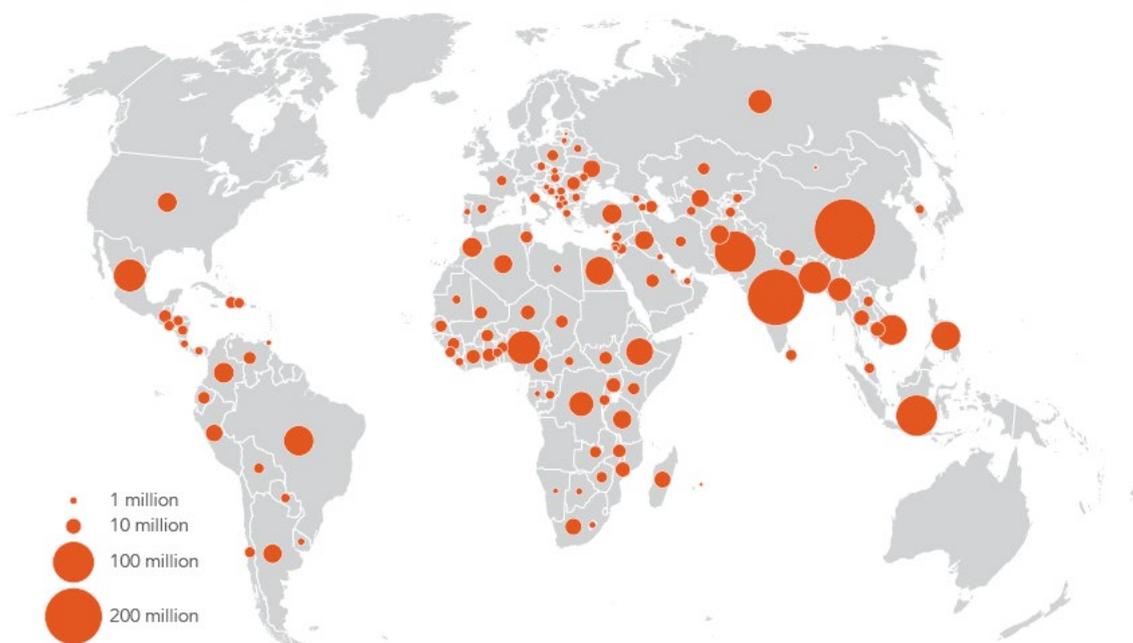
For example, in strategies that focus on improving customer service, tax administrations normally seek to shift traffic from resource-intensive areas to less costly channels, and in the past that has seen some administrations focus on moving from counter services to large scale call centres. Although replacing over-the-counter services by telephone service represents a significant efficiency gain, those that do not have such a service may have the opportunity to leapfrog that stage, as well as the significant investment that can be required for developing physical call centres, and go straight from counter services to a combination of electronic communication, including text, emails chatbots and electronic guidance material. This can allow routine queries to be handled very efficiently, and resources can be focussed on the more complex questions.

Barrier 2 – Lack of access to financial services

The core purpose of a tax administration is the efficient collection of the money that is owed with the least possible burden to taxpayers. The efficiency and cost of collection for the taxpayer and the administration is heavily influenced by the taxpayer’s access to financial services which can facilitate these transfers. Access to traditional banking services in developing countries can be low, as illustrated in Figure 1.4.

Figure 1.4. Adults without bank accounts in 2017

Globally, 1.7 billion adults lack an account
Adults without an account, 2017



Note: Data are not displayed for economies where the share of adults without an account is 5% or less.

Source: Global Findex database, as reported in (WBG, 2018^[12])

However, the growth in mobile telephony is helping to overcome this through the creation of mobile-based financial services. These services can provide access to networks that facilitate electronic money transfers quickly, easily and relatively cheaply without the need to use traditional banking services. Again, there is rapid take-up of these services in developing countries, with for example estimates of 500 million mobile money accounts in sub-Saharan Africa in 2020 (GSMA, 2020^[13]). This rapid growth is expected to continue as mobile service providers partner with traditional financial service providers to bring greater access to financial services through mobile telephones.

As taxpayers gain greater access to innovative financial services, this not only allows them to make payments and receive refunds more easily and efficiently, it can also provide a rich data source that can help with tax compliance. Given legislation allowing tax administrations access to data from mobile companies with financial services, administrations can work with these companies to build tax compliance into the growing networks. For example, through effective data exchange between administration and the service providers, the administration can obtain more details on the income of taxpayers, or they can convey tax compliance messages to the taxpayers to inform and remind them of their obligations.

Final words

Digitalisation is transforming economies across the globe, with wider digitalisation bringing competitive advantages to a country as businesses and citizens communicate and transact their business more quickly and efficiently. Tax administrations are not immune to these changes, and need to be considering how they can embrace them to maximise the opportunities they can bring.

The next part of this report uses the experiences of tax administrations across the globe, and the many different approaches taken, to identify some core aspects of successful digitalisation journeys, with a particular emphasis on developing country circumstances.

Part II. Digitalisation journey guidance



Given the unique circumstances in which digitalisation of a tax administration is planned, this part of the report does not seek to recommend a specific approach. Instead, it identifies the three common stages, explored in the following chapters, that tend to be part of successful digitalisation journeys:

1. **Thorough context analysis.** It is critical to all digitalisation journeys that an analysis of the current situation is conducted to provide insight into the context in which the digitalisation project or projects will operate. This ensures for instance that potential challenges are highlighted, the views of different stakeholders are taken into account and the relevant opportunities for digitalisation are identified.
2. **Clear digitalisation strategy.** Although the direction of a digitalisation journey may be adjusted many times according to altered circumstances, it is essential to have a digitalisation strategy that can guide the journey and ensure a coherent approach and consistent progress in the right direction.
3. **Managing effective strategy-based projects.** While the strategy lays the foundation of the digitalisation journey, undertaking successful strategy-aligned digitalisation projects ensure practical and lasting results.

Although it is advised to complete the context analysis before producing the strategy, and approving the first edition of the strategy before starting any projects, it is highly likely that the first two stages will have to be revisited many times during the digitalisation journey of a tax administration. Circumstances change, with new opportunities and challenges arising, and these need to be analysed and addressed in a timely manner. Administrations are encouraged to regard this as an iterative process.

2 Context Analysis



Understanding the context of the digitalisation journey is paramount to success.

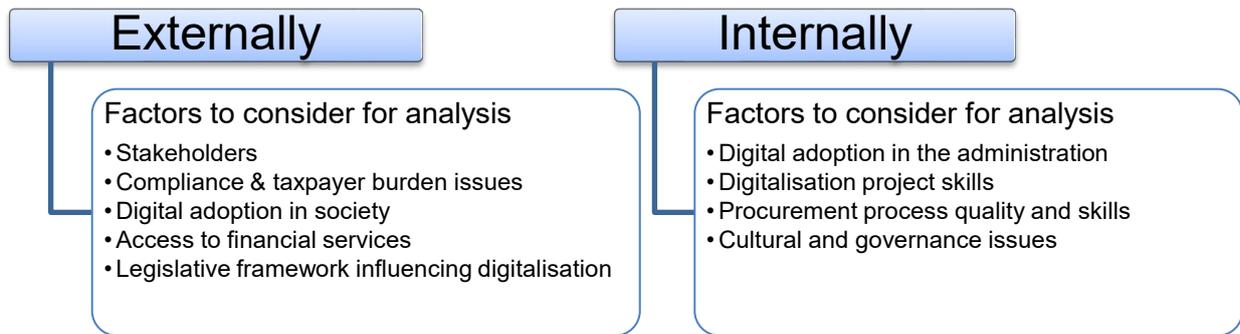
Understanding the context, both externally and internally, in which the digitalisation journey will take place is paramount to success. This not only helps a tax administration understand the environment in which a project operates and the needs of stakeholders, it also helps anticipate constraints and opportunities.

Ideally, the analysis is not limited to the current environment; it also includes a horizon scanning element to detect early signs of potentially important future changes, for example in taxpayer behaviour or technological trends. This can aid the administration management in considering how to future proof their work and will be helpful when they have to quickly adjust the administration's strategy due to sudden changes, as they already have a good understanding of their operating context.

Using the findings from completed and ongoing tax digitalisation projects, this chapter provides recommendations on what to analyse, to ensure that the context in which the project operates is fully understood, while further observations related to the analysis methodology and tools that may be used can be found in Annex B.

As illustrated in Figure 2.1., it is common to consider two groups of factors for analysis: factors external to the tax administration that may influence or be influenced by digitalisation, and factors concerning the internal capability of the tax administration to address the opportunities and challenges that are being uncovered through the external analysis.

Figure 2.1. Common factors to consider during context analysis



While this is not an exhaustive list of factors, it is considered to cover the most common ones. It is also worth noting that the analysis may prove to be an iterative process, with insight gained from one area stimulating revisions to work previously done. In some cases, the analysis may also be executed in a larger context, for instance as part of a Medium Term Revenue Strategy (MTRS).⁵

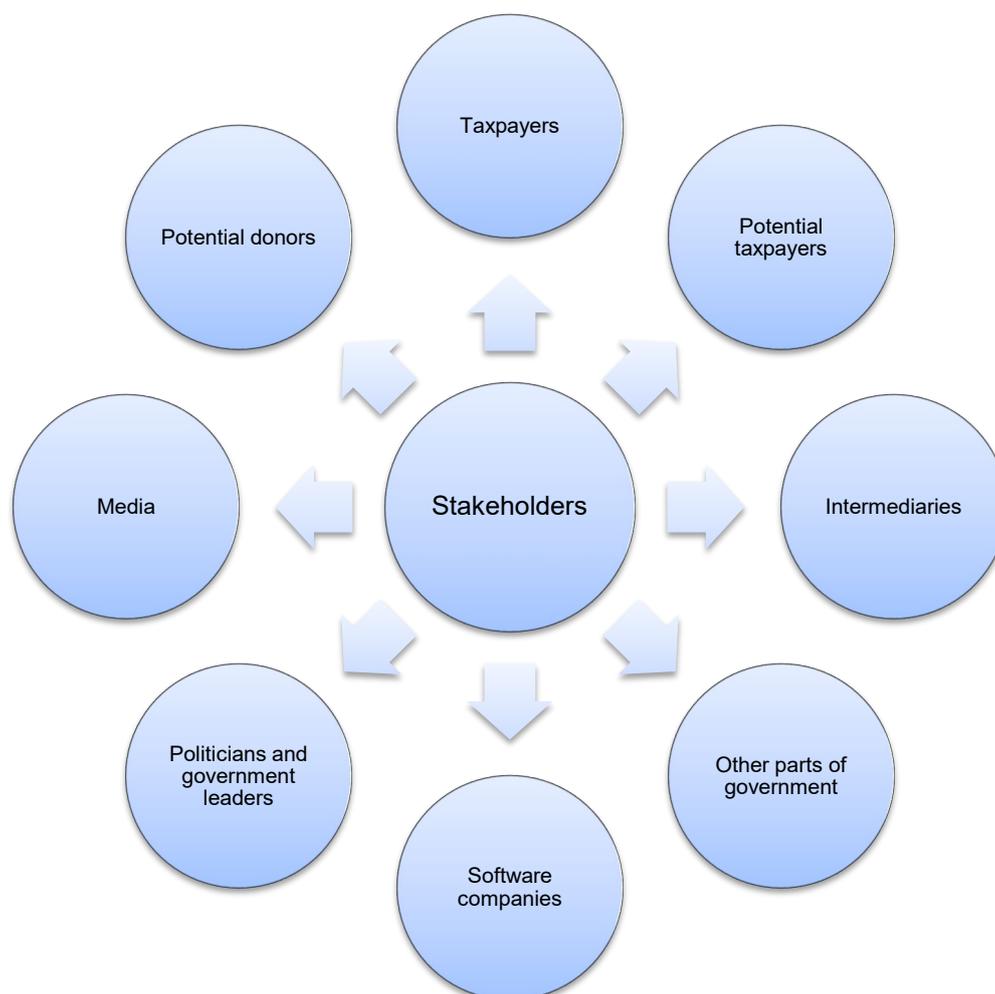
Common factors for external analysis

Stakeholders

An OECD study on digital governance strategies (OECD, 2019^[14]) showed that lack of engagement with relevant stakeholders increases the risk of implementation challenges. Stakeholder analysis can help understand how the digitalisation strategy may impact key stakeholders and what their requirements might be. It also helps identify who are critical influencers for a project's success, and can be used to devise strategies to get their support or address their concerns. The most common stakeholder groups for digitalisation projects in tax administrations are summarised in Figure 2.2. and analysed below, noting that local circumstances may mean that other stakeholders also have to be considered.

⁵ For more information on MTRS and other international methods, tools and offerings that may be relevant for analysis, see Chapter 7.

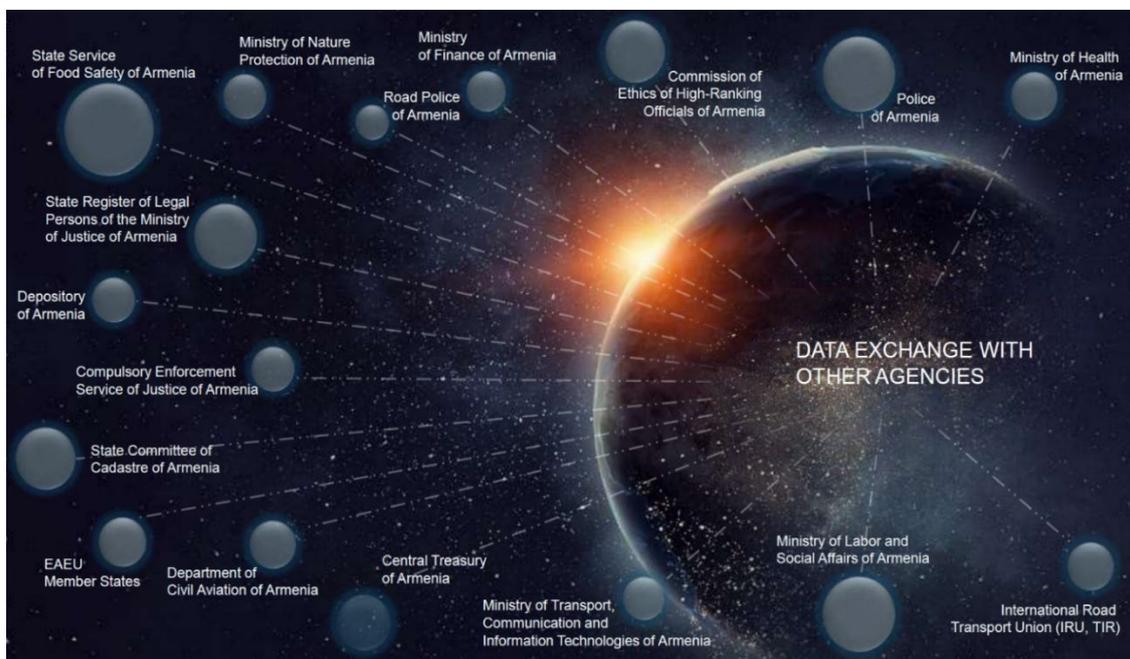
Figure 2.2. Common stakeholder groups



- **Taxpayers** are often the most complex group of external stakeholders, ranging from individual income tax payers via small and medium businesses to international enterprises. It is common to use this analysis to create segments of taxpayer groups with shared characteristics or attitudes and to assess how each distinct taxpayer segment may be affected by the changes. The digitalisation strategy can then ensure that the needs of segments of taxpayers are being addressed, and that plans adapted to each segment are created to ensure the appropriate messages and approaches are used. The taxpayer perspective on digitalisation opportunities and challenges is increasingly becoming the focal point of digitalisation in tax administrations, adding further impetus to this analysis.
- In addition to the taxpayers currently contributing to the overall revenue, **potential taxpayers**, individuals and businesses in the informal economy with potential for becoming taxpayers, could be included in the analysis. When relevant, the analysis should distinguish between those choosing to operate partially or fully outside the formal economy and those unaware of or unable to fulfil their tax obligations.
- **Tax agents and other intermediaries** can be an influential group, and their opinions can significantly influence the outcomes of a digitalisation strategy. They may also be a target group as users of digital services, so it is important that these stakeholders see digitalisation projects as positive for their line of business and their customers.

- Support from **politicians and government leaders** of other departments is often a critical success factor for digitalisation. By mapping those that can influence the success of the work and understanding their motivations, plans can be developed for interaction with these stakeholders in order to create win-win outcomes. This mapping is often coordinated with the mapping of wider government.
- Analysing current integration and interdependencies with **other parts of government** is necessary to understand the opportunities and challenges for joint government services, as well as those who may be interested in collaboration. The analysis should aim to identify units that may have a relationship with the tax administration in the context of digitalisation, and may expose a wide range of influencers and dependencies. Figure 2.3. illustrates the data exchange between government agencies and the tax administration mapped by Armenia for a project uncovering tax fraud using Artificial Intelligence, and highlights the breadth of influencers and dependencies.
- Some **software developers** may become important partners in the digitalisation journey, as they may choose to integrate or expand tax administration functionality in their software. Understanding this market can provide insight into the environment in which digitalisation projects may operate, and depending on local circumstances, individual developers, national software companies and international software corporations may have to be included in the analysis.
- **Media** backing can help improve the public perception of the administration's work, and contribute to the successful launching of digital services. Analysing opportunities for media support is ideally done in conjunction with the analysis of taxpayer groups, to gain insight into which channels work best for each group.
- There may be **potential donors** available to support the digitalisation ambitions of the tax administration. An analysis of these potential stakeholders and their conditions for supporting digitalisation projects may influence the shape and direction of the strategy.

Figure 2.3. Armenia: example of data exchange with other entities



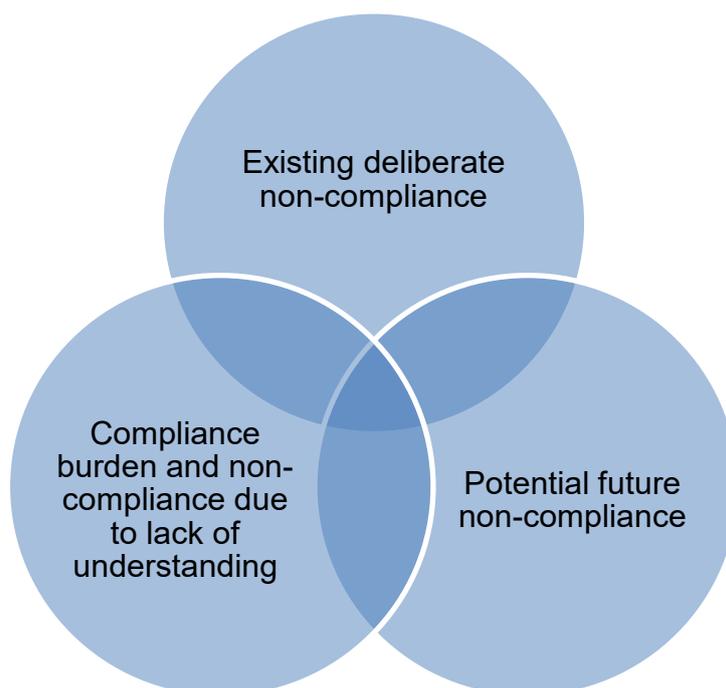
Note: The figure illustrates the data exchange with agencies outside the tax administration for a project uncovering tax fraud using Artificial Intelligence.

Source: Presentation from Armenia State Revenue Committee, March 2021: <https://oecd.org/tax/forum-on-tax-administration/publications-and-products/Armenia-AI-and-ML.pdf>.

Compliance and taxpayer burden issues

Knowing where to focus a digitalisation effort may seem like a daunting task. Mapping the most prevalent domestic tax compliance and taxpayer burden issues can help the administration prioritise target areas for digitalisation, since resolving such issues is likely to be part of the digitalisation purpose. Based on research and tax administration interviews used to prepare this report, three broad areas for analysis which include a range of common issues have been identified, as illustrated by Figure 2.4. and discussed below.

Figure 2.4. Common compliance and taxpayer burden issue areas



- **Areas of existing deliberate non-compliance.** This may relate to taxpayer registry issues, expected or known areas of corruption, shadow economy issues like unregistered businesses, under-reporting or unreported income, costs inflation, identity fraud, cross-border fraud and money laundering and many other areas.
- **Areas of potential future non-compliance.** Digitalisation is creating new business models that are challenging existing models of taxation and creating opportunities for new models to be created. By analysing emerging and future compliance risks, opportunities can be identified to prevent that non-compliance from arising. For example, in the sharing and gig economy space, this may mean working with platforms to help improve taxpayer understanding and compliance, including possibilities for direct information sharing with the tax administration.
- **Areas of compliance burden and non-compliance due to lack of understanding.** Complex tax systems and processes can lead to a heavy administrative burden for taxpayers and increase the probability of non-compliance due to lack of understanding, and the potential for reducing these issues through digitalisation is considerable. By analysing areas where there are frequent errors or complex or costly processes, a tax administration may identify opportunities to reduce or remove the issues. It can also be helpful to analyse where there seems to be significant misunderstanding by taxpayers. Common issues within the scope of control of the tax administration include fragmented taxpayer services and complex and costly processes for registration, filing and payment.

Digital adoption in society

Current digital skill levels and levels of access to appropriate digital services for current and potential taxpayers groups constitute critical information for digitalisation plans. Not only does it help identify groups that are likely to be able to use such services, it can also identify constraints that should be considered.

Since access to stable electricity supply is a fundamental requirement for all digital services, this should be mapped as a preparation for the digital adoption analysis. Considering the rapid development in this area,⁶ both traditional grid-based and newer off-the-grid private or commercial solutions should be taken into account. For those with grid- or other commercially based access, the *stability* of such access is also relevant for tax administration digitalisation: The frequency and severity of outages may influence both the design of the uninterruptible power supply solutions of tax offices and the outage resilience solutions of taxpayer service interfaces.

Building on this mapping, the analysis may cover:

- **Access to stable Internet services.** Understanding which sections of society have access to the internet, the way they access it (e.g. mobile data, wireless or wired internet), the cost of access and the stability of the access is useful to help identify and segment project stakeholders, as well as informing digital service design. For instance, the administration may need to design taxpayer service solutions to allow for low-bandwidth internet connections if a large part of the population is using mobile internet services. (Kenya Revenue Authority, 2021^[15]) Similarly for stability: if frequent outages can be expected, the solutions should allow for offline work with automatic synchronisation whenever the network is available.
- **Digital skill level and access amongst personal taxpayers.** Understanding the levels of digital literacy and access to digital interfaces amongst personal taxpayers helps targeting the digital strategy and identifying target audiences. Similarly, if some taxpayer groups don't have personal access to digital interfaces, the digitalisation project might include options for accessing tax systems at internet cafés or other public places, with additional security features added as appropriate.
- **Digital skill level and access in the private sector.** Tax administration processes are often closely connected with other societal financial processes, and digitalisation can increase this, for instance through introducing electronic taxpayer services, or by sharing data across government. Understanding the level of digitalisation among taxpaying businesses who are also potential taxpayer intermediaries, data providers, data recipients or co-creators of digital taxpayer services like financial software with tax functionality, will help determining the feasibility, complexity and scope of the tax administration digitalisation project. Furthermore, this sector can offer valuable input with regard to challenges and opportunities that can be addressed through digitalisation of tax processes.
- **Technology adoption in government.** Mapping limitations and opportunities with regard to technology adoption in the rest of government can serve several purposes. For instance, it is likely to help uncovering *current limitations*, like existing paper-based solutions in other entities that may have to be replaced in order to achieve end-to-end digitalisation of tax processes; it may uncover opportunities for the tax administration *taking the lead* in the country's digitalisation journey, letting society reap benefits beyond the administration's area of responsibility; and it may uncover *opportunities for digitalisation collaboration* with other areas of government in order to improve taxpayer service and tax compliance. An example of the latter comes from Tanzania, where a

⁶ Analysts from the energy company Statkraft in 2020 found that over the last decade, the cost of solar energy plants has been reduced by 80%, the cost of wind energy plants has fallen by 50%, and the cost of batteries has fallen by 80%, drastically increasing the affordability of such solutions. (ONS - Energy Meeting Place, 2020^[62])

solution for biometric identification of voters was expanded so that it could be reused for taxpayer identification.⁷

Access to financial services

The core mandate of tax administrations is to collect revenue for public services, and efficient collection in digital services depends on electronic financial services. The level of financial sophistication and the use of electronic financial services are therefore crucial factors to analyse. The analysis should consider at least the following areas:

- **Level and sophistication of traditional banking adoption:** As mentioned in part 1, around 1.7 billion adults across the globe do not have a bank account. For those with accounts, tax administration collection efficiency will depend greatly on whether electronic transfer solutions are available.
- **Availability of mobile banking and similar financial services:** The growing availability of non-traditional financial services can allow much larger groups of the population to participate in the digital economy as well as opening for digitalisation measures by the tax administration, and mapping such service availability is therefore a common part of the analysis. Many countries have launched digital wallet or mobile money solutions as an alternative to cash for those without access to traditional banking, and opportunities for direct tax payment by mobile is on the rise. (IMF, 2017_[16]) At the same time, administrations have to consider that mobile banking solutions may facilitate new forms of financial fraud and tax evasion (Traynor, 2015_[17]) and plan countermeasures accordingly.

Legislative framework influencing digitalisation

Some elements of the current legislative framework may represent opportunities for tax administration digitalisation while other elements may represent constraints or challenges to be handled. For instance:

- In the context of rapid technological change it is important to consider *if* new legislation is needed, and whether existing frameworks can be adapted. For instance, a report from the IMF suggests that it may be possible for countries to tax the Sharing and Gig economy on the basis of existing legislation. (IMF, 2017_[16]) This may open opportunities for the tax administration to implement compliance-improving changes without having to wait for legislative changes.
- Lack of legal recognition of electronic documents may make it difficult to introduce electronic filing or electronic invoicing.
- The legal foundation for the tax administration as an institution may influence its ability to autonomously initiate digitalisation projects.

The analysis of the existing framework can be used when describing digitalisation objectives and choosing deliverables aimed at accomplishing the objectives. Furthermore, as the timeline for legislative change can be long, understanding current legal limitations can aid in the dialogue with lawmakers regarding the possible introduction of timely changes, and lay the groundwork for future successful projects.

⁷ Source: Meeting with Mr. Sweetbert Soka, Legal Counsel in International Taxation - Large Taxpayers Department, Tanzania Revenue Authority, January 2021.

Common factors for internal analysis

Digital adoption in the administration

Understanding the existing ICT capability and potential ICT issues may be among the most important inputs for forming the digitalisation strategy, as it provides insight into the strengths and weaknesses of the current digitalisation of the tax administrations. Common areas for analysis include but are not necessarily limited to the following:

- **Network infrastructure:** The analysis typically includes the following:
 - Does the administration have adequate firewalls around the ICT systems?
 - Is there a virtual private network for interoffice communication, and is the quality adequate?
 - Is the quality of other security measures such as network monitoring adequate?
- **Core tax systems:** Do the core tax systems (or the single integrated system) cover at least the following functions?
 - Taxpayer services,
 - registration,
 - filing including third party data and prefilling where relevant,
 - collection,
 - enforcement,
 - disputes,
 - compliance risk management,
 - necessary case handling for all components, and
 - integration of all components.
- **Supporting tax systems:** This may include elements like
 - Analytics services and
 - case handling systems.
- **Business administration systems:** The quality and efficiency of the following management systems may need to be verified if relevant:
 - Human resources and knowledge,
 - finance,
 - procurement, and
 - fixed assets.
- **Level of integration or fragmentation:** This may for instance include checking the following related to the ICT system and data architecture:
 - Is it possible to see all data for a taxpayer in a single interface, or does the tax official have to access several systems in order to get that overview?
 - Does the administration use a single taxpayer identity across all ICT systems, or do some systems use their own identifiers?
 - Is there a single system handling a particular tax, or are there several systems?
- **Data storage and ownership:** Taxpayer data for which the administration is responsible should be securely stored and owned by the tax administration.
 - Is the data stored on premises or in a cloud solution, and is the storage secure with regard to hacking, natural disasters and other types of crises?
 - Is the data legally owned by the tax administration or by the company storing it?

- **Staff skill level:** This should be mapped for areas like:
 - Generic security knowledge and awareness
 - Core ICT skills, for instance related to office ICT solutions
 - Core tax system competence as appropriate
 - Supporting tax system competence as appropriate
 - Business administration system competence as appropriate.

Information on staff skills can be used to correctly assess how much and what kinds of training should be included in the digitalisation project plans, and will also be useful when assembling teams for digitalisation projects and planning the in-project training necessary for successful project execution.

Digitalisation project skills

Digitalisation projects place heavy demands on particular skill sets in addition to those normally required in a tax administration. By completing a mapping of such skills, existing capabilities as well as gaps can be understood. This can help ensure that the projects being planned have access to the necessary resources with the appropriate skills. These skill needs usually include:

- **Programme and project management skills:** There are many examples of projects struggling because of basic project management mistakes related to scope, time, cost, resource, risk or quality management. Furthermore, the complexity and scope of the tax administration digitalisation journey means that a single project is usually not sufficient – a digitalisation programme with multiple projects is often needed. By mapping the programme and project management skills among staff, the administration will get an indication about the need to increase the existing capability.
- **Change management skills:** Successful digitalisation hinges as much on changing the way the tax administration works as it does on the ICT systems it introduces, since many ICT systems are meant to support work processes. Ensuring that the organisation effectively implements the changes needed to maximise the effect of digitalisation changes is critical to the success of most projects, and by assessing the current change management skills, gaps can be identified and supplemented where needed. The need for change management skills is as important for top managers and middle managers as it is for staff, so the mapping should ideally cover all parts of the organisation likely to be affected by digitalisation.

Procurement process quality and skills

Public procurement represents on average 12% of GDP in 2018 in 190 countries studied by the World Bank, with some countries using as much as 28%. (Bosio and Djankov, 2020^[18]) Consequently, it is a crucial pillar of service delivery and has a significant impact on government project outcomes, including many digitalisation projects which often include procurement of services, software and hardware. By analysing the status of the procurement process quality and skills within the administration, training or hiring needs or needs for modifying the procurement process can be uncovered.

The Methodology for Assessing Procurement Systems (MAPS)⁸ recommends that the following areas of procurement are covered by the analysis:

- **Value for money:** the basic goal that every procurement system should be providing the required goods, works and services in an economic, efficient, effective and sustainable way;

⁸ For more information see <https://www.mapsinitiative.org/> and Annex A.

- **Transparency:** the basic and commonly agreed-upon principle of disclosure to make policies, legal and institutional frameworks and information related to decisions available to the public in a comprehensible, accessible and timely manner;
- **Fairness:** the ambition that the public procurement process should be free from bias, ensure equal treatment and take decisions accordingly, thus ensuring integrity; and
- **Good governance:** recognising the importance of the wider governance context on the way public procurement is conducted and how reforms to procurement are implemented. This aspect includes a reflection of horizontal procurement goals, policy considerations and integrity principles.

Cultural and governance issues

An important skill necessary for virtually every digitalisation project is the ability of the staff to adapt to changes in tasks, processes and organisational structure, and the ability to adapt often hinges on the change culture of the administration. Although measuring tax officials' willingness to change may be difficult, it should be assessed as accurately as possible: With staff resistant to change, the administration will need to spend more time and effort motivating and preparing for the changes introduced through digitalisation.

Since the current organisational model may have impact on and be impacted by digitalisation, relevant aspects related to organisation should be mapped. For instance:

- If the organisation is currently decentralised with significant local autonomy, digitalisation steps introducing automation of tasks are likely to lead to centralised management of work processes, triggering organisational changes.
- If a large number of staff are currently involved in tasks that may be taken over by ICT-supported automation, there may be need for organisational changes to adapt to the new work patterns.

From vision via detailed analysis back to the big picture

The context analysis starts with a high-level vision of digitalisation which includes a set of assumptions about the opportunities and challenges that may be uncovered. The assumptions will be challenged or confirmed through the detailed and analysis work, resulting in a large set of information detailing the current and expected near-future status of factors influencing or being influenced by digitalisation. This information set needs to be synthesised and aggregated up to a big picture of the situation in which the administration operates. Although the details uncovered are likely to prove useful many times over the digitalisation journey, a concise summary of the findings is needed to inform the next stage of the digitalisation journey: Creating a digitalisation strategy.

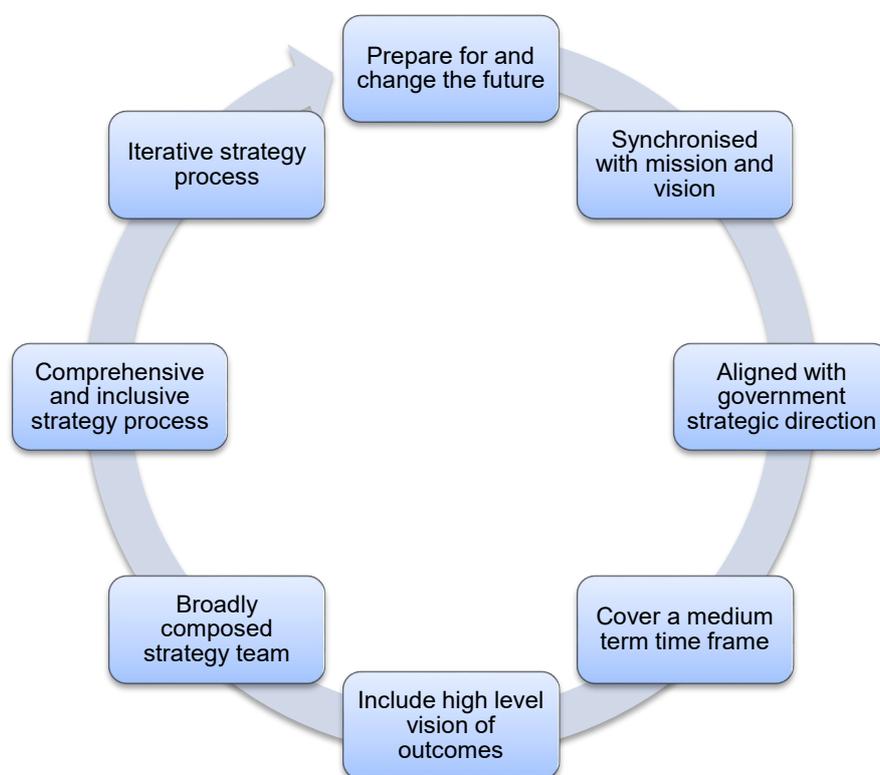
3 Creating a digitalisation strategy

Successful digitalisation strategies prepare for and aspire to shape the future.

Successful digitalisation projects are usually rooted in a clear strategy which defines the direction and pace of the digitalisation journey. It also establishes expectations for the tax administration regarding digitalisation benefits as well as the timing of these benefits. This chapter highlights common characteristics of successful digital strategies and suggests some common elements to include in a strategy. Complementing this chapter, Annex B offers observations for a possible process with corresponding tools for drafting, refining and approving the strategy.

Figure 3.1. and the text below discuss common characteristics of successful digitalisation strategies.

Figure 3.1. Common characteristics of successful digitalisation strategies



Successful digitalisation strategies both *prepare for and aspire to shape the future*, outlining what should be changed through the strategy in order to accomplish its objectives and taking into account the expected societal conditions in which the changes will occur.

They are *synchronised with the wider mission and vision* of the tax administration, to ensure that digitalisation changes move the administration in the same direction as the wider work. In turn they are also *aligned with the government's overall strategic direction* and vision for the future with regard to digitalisation: Taxpayers affected by digitalisation of the tax administration will be similarly affected by other societal digitalisation initiatives, and coordination of such initiatives has the potential to generate considerable synergy effects.

Successful strategies commonly *cover a medium term time frame*. This allows for successful implementation of digitalisation projects while leaving room for adaptation to changes: As technological change can be extremely rapid, planning too far ahead may be wasted work. For the same reason, such strategies avoid a deep level of granularity, and instead articulate *the high level vision of outcomes* the administration wishes to achieve. This approach allows projects based on the strategy to operate with a larger degree of flexibility.

The responsibility for creating the strategy will vary between administrations, but it is generally recommended to *use a broadly composed team* which includes members from relevant departments and disciplines. Although technology is the core component of digitalisation, changes to processes, legal framework, human resource responsibilities and organisational model are usually just as crucial for successful digitalisation.

A *comprehensive and inclusive process* which encourages widespread engagement during its development and emphasises the taxpayer perspective is often the hallmark of a successful digitalisation strategy, as:

- This is likely to increase the quality of the strategy as it has a broader base of understanding of the challenges at hand and the benefits that can be gained.
- It will probably simplify the process of change management, as those that have been directly involved in developing the digitalisation strategy are more likely to support the changes that come out of it and voice their support to their peers.
- It is likely to contribute to managing expectations regarding the outcomes and benefits of digitalisation.

Finally, those who develop successful strategies *recognise the iterative nature* of the process. The strategy is regularly revisited, for example at the end of every digitalisation project and at regular intervals. This ensures that goals are being met and benefits are gained as planned, and that when the context of the strategy changes, the strategy is also updated.

Common elements of a digitalisation strategy

Whilst this report does not recommend a specific framework for a digitalisation strategy, it does identify some core elements that should be considered for inclusion, as summarised in Figure 3.2. and discussed below.

Figure 3.2. Common elements of a digitalisation strategy



Describing digitalisation objectives

The choice of digitalisation objectives should be *based on the results of the analysis* of the current situation and is therefore likely to differ between administrations. One administration may have uncovered an urgent need to reduce taxpayers' burdens; another will prioritise the need to make the administration more efficient and a third will focus on increasing revenue, or the primary objective may be reducing operational costs or ensuring uniform treatment of taxpayers. Some administrations find that supporting business growth needs to be given top priority, while other administrations will focus on reducing corruption, enhancing accountability and improving transparency.

It is common for successful digitalisation strategies to have a *limited and focussed set of objectives* rather than going for an all-encompassing approach, to ensure that the scope of the objectives is achievable. This can lead to difficult discussions about what to prioritise, but the process of prioritisation is likely to be both necessary and useful. Of course, there can be spill-over benefits where a prioritised objective helps achieve other objectives, as they are often interlinked; for instance, research shows links between reduced corruption and improved tax morale.⁹

Many developing country tax administrations choose to link their digitalisation objectives to the Sustainable Development Goals (SDGs). In a statement presented at the conclusion of the First Global Conference of the Platform for Collaboration on Tax (PCT) in 2018, the PCT partners IMF, OECD, WBG and UN emphasised the key role of taxation in achieving the SDGs. (PCT, 2018^[19]) The statement mentioned equality, positive impact on investment and growth, empowerment of women, environmental sustainability and better extraction of natural resources as some of the SDG goals positively influenced by taxation. Fulfilling digitalisation objectives such as increased revenue, reduced operational cost and uniform treatment of taxpayers can contribute to achieving these goals.

While digitalisation objectives related to for instance tax administration efficiency, taxpayer compliance, revenue and taxpayer services commonly are considered, improvements in the *business execution function* of the tax administration should also be considered as valid objectives on their own. Improving areas such as accounting and human resource management can improve the effective functioning of the tax administration, leading to cost savings, and in turn contribute to wider objectives such as improved compliance.

⁹ See for instance how perceived legitimacy of the tax administration has significant impact on tax morale in (OECD, 2019^[61]).

Defining deliverables

While the objectives usually constitute the foundation of the digitalisation strategy, the deliverables, sometimes called building blocks, are likely to make up the core and largest part of the strategy, as they operationalise and solidify the objectives.¹⁰ For instance, if improving the compliance of small and medium enterprises is included in the administration's digitalisation objectives, analysis is likely to have uncovered a range of factors that may potentially influence compliance among these taxpayers; the team would need to decide which of the factors to target for change through digitalisation, and define deliverables that can accomplish the desired change.

When considering what the strategy should deliver, it is common to prioritise *quick and simple solutions* early in the process, in order to achieve successful results as early as possible. This can be of great benefit as it helps motivate stakeholders for further changes and tends to increase the support for continued digitalisation internally and externally.

However, the desire for quick wins should not allow the achievement of the overall digitalisation strategy to be put at risk: Small disconnected islands of digitalisation in a sea of traditional tax administration processes often do not support the overall objectives. Those building the strategy should bear in mind that they may have to make unpopular choices about what to prioritise, to ensure that the long term success and strategic direction of the administration is not hampered by short term wins.

Tax administrations should look for opportunities to use the deliverables to accelerate their digital journey through partial or complete *leapfrogging* of steps, where local legislation allows. For instance:

- Allowing taxpayers to switch from tax payment by cash to mobile banking, partially leapfrogging the traditional banking system stage.
- Replacing paper forms with tax functionality built-in to commercial financial software which communicates with the tax systems via Application Programming Interface, leapfrogging the stage of traditional electronic forms.
- Combining over-the-counter to chat, SMS, social media and other electronic services, partially or fully leapfrogging investment in physical call-centre.
- Moving from manual solutions or old legacy system to renting tax system in the cloud, leapfrogging the tailor-made or off-the-shelf software stage.

Boxes 3.1 and 3.2 exemplify partial or full leapfrogging.

¹⁰ The term deliverables can also be used for individual deliverables within the scope of a single project. The deliverables described in a digitalisation strategy are however usually more comprehensive and generic.

Box 3.1. Russia: Leapfrogging the stage of traditional electronic forms

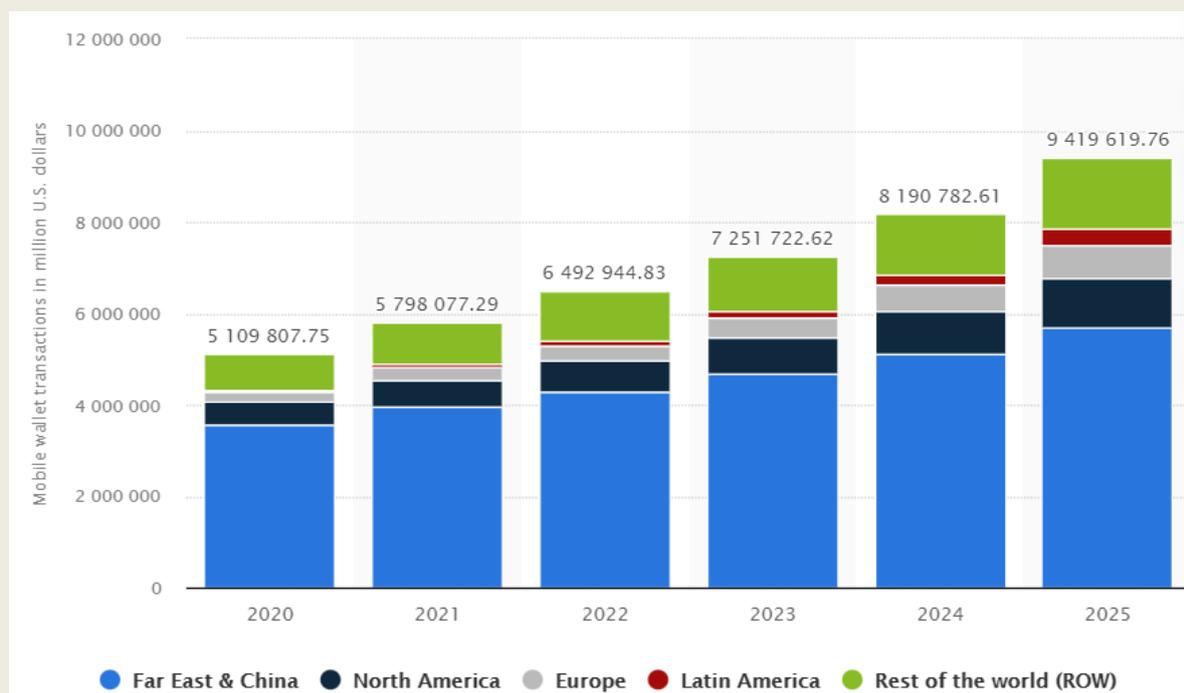
The new online service solution “My Tax” allows freelancers to register in just a few minutes for this new tax regime remotely with a mobile device, and keep income records, issue payment invoices and pay professional income tax via the platform. All the recordkeeping, tax payments and accounting are done “on the go” by the system, and the software solution also includes an API that allows banks and digital platforms to integrate taxes into their environment.

There is no need to submit any reporting or returns. The taxes are deducted automatically on a transaction-by-transaction basis. Thus, the software solution provides an end-to-end seamless experience for this new category of taxpayers.

Source: (OECD, 2021^[20])

Box 3.2. World statistic: Partially leapfrogging the traditional banking stage

As illustrated by the following projection from [statista.com](https://www.statista.com), mobile wallets are becoming an increasingly relevant alternative for financial transactions, allowing societies to partially leapfrog the traditional banking stage:



Source: <https://www.statista.com/statistics/1227576/mobile-wallet-transactions-worldwide/>

Exploiting *current advances in computer science* like Big Data Analytics, Artificial Intelligence, Cloud computing, Blockchain and Internet of Things may give remarkable results in digitalisation processes and should be exploited where appropriate, giving due consideration to information governance, ethical use of

technology and transparency. However, such advances should probably not be used as arguments for choosing deliverables: In the context of digitalisation of tax administrations, technology should fulfil business needs, not the other way around.

For further inspiration and ideas for which deliverables to include, Chapter 5 offers suggestions for digitalisation areas and deliverables in these areas, including examples from tax administrations; and the discussion document *Tax Administration 3.0: The Digital Transformation of Tax Administration* (OECD, 2020^[8]) suggests six core building blocks of future digitally transformed tax administrations.

Once the deliverables have been chosen, an *initial ordering*, preferably indicated on a timeline, can be quite beneficial: This will implicitly define the deliverable prioritisation as well as the expected length of the digitalisation journey, contribute to managing stakeholder expectations and, during the strategy drafting process, provide a valuable basis for discussion about the order in which needs are fulfilled.

Human resource management aspects

The single unifying term for digitalisation projects is *change*. For instance, taxpayers may have to change the way they interact with the administration and comply with their responsibilities; digital systems may replace paper procedures; administration staff may need to learn new tasks; the organisational model may change with new teams created and others adjusted. All this requires a culture of openness to change in staff and taxpayers, which may have to be initiated and driven forward by the tax administration to ensure a successful digitalisation process. The necessary change management processes for driving a culture of change should be outlined in the strategy, coordinated with a proactive human resource function to ensure staff satisfaction.

Sometimes external events will instigate changes that the administration can utilise to positively influence the culture of change. For instance, the COVID-19 pandemic has compelled many tax administrations to drastically increase digital interaction with taxpayers, and this is likely to have changed some taxpayers' attitudes towards such interaction. Administrations may have an opportunity to build on this momentum to ensure that the change in attitude is sustained.

When planning administration-internal change management, the focus should not only be on mitigating possible negative perspectives such as concerns about job security or personal capability. By highlighting the many *positive benefits* of a digitalisation strategy, the strategy can have a positive effect on staff motivation by outlining opportunities for learning new skills and working on more interesting tasks. For instance, for staff in taxpayer interaction positions, the introduction of a chatbot that can answer routine questions usually means that the interesting and complex questions are left for them to answer. Depending on local circumstances, it may be appropriate to connect opportunities for learning and career changes directly to the relevant deliverables.

The human resource management aspects covered in the strategy should also outline principles for skills development; although specific training, recruitment and other skill-increasing activities will be mandated to the project where the skills are needed, the guidelines should come from the strategy.

Box 3.3. summarises the work done by the Thai Revenue Department to develop a taxpayer-centric mind set among the staff. Further recommendations for handling the human resource aspects of change are discussed in Chapter 4 and Annex C.

Box 3.3. Thailand: Driving change to develop a taxpayer centric mind-set

As part of the Thai Revenue Department (TRD) people management and development policy, TRD has deployed the D2RIVE strategy which promotes organisational culture reform. Through this strategy, TRD staff are motivated to become more adaptive to change, which helps enable digital transformation across the organisation. Moreover, the TRD workforce is encouraged to promote Honesty, Accountability, and Service Mind set, while at work.

TRD has particularly aimed to embed a taxpayer centric mind set, where every staff member thinks about taxpayers' needs and convenience and is more aware of how their decisions and consequences affect the taxpayer experience. As part of this TRD has focused on solving taxpayers' pain points and using technology to continuously improve its administrative efficiency to support taxpayers' compliance efforts. To promote innovation in the organisation, TRD has adopted Design Thinking to encourage its workforce on all levels including the management team to think differently about its services and offer some fresh solutions.

As part of this, TRD has recently restructured its organisation by establishing two divisions: the International Tax Affairs Center, and the Center for Data Innovation and Intelligence. This restructuring aims to pursue the digital transformation initiative by focusing on the practical use of data analysis and integration to improve tax collection policies, tax administration, and taxpayer services efficiency. Furthermore, TRD has hired enterprise architects to work on standardising tax procedures and solving challenges around digital platforms in order to align with the management policy to drive technology transformation. The Enterprise Architecture emphasises various aspects such as Business Architecture, Application Architecture, Data Architecture, Technology and Infrastructure Architecture and Security Architecture.

In terms of human resource development, TRD places significant emphasis on officials' learning and development through multiple tools and methods. Learning and career development journeys are constantly designed to ensure that every official has adequate skills and competencies to do their work. They are required to complete intensive training courses and are also encouraged to develop themselves through other reskill and upskill courses provided, such as taxpayer service delivery, basic data science, and agile methodologies. In addition, TRD provides its officials with an online learning platform called 'RD tax school', containing over a hundred online courses. The officials may choose to access the resource bundle anywhere and anytime.

For more information, please contact email.ita@rd.go.th.

Source: Email from the Thai Revenue Department, October 2021.

Financial aspects

Without the necessary financial resources the digitalisation journey will fail, so the strategy needs to outline a plan for financing the journey. The financial plan should cover initial investment as well as continued maintenance, even if investment and operational costs are covered by different budgets, in order to ensure that the investment is sustainable. It is likely that the budgetary figures will be uncertain at this stage, but they will nevertheless give useful insight into the expected scale of necessary financial resources. The first two stages of this process are normally done as part of developing the strategy, while the third usually is prepared along with the strategy although it will take place when the strategy is enacted:

- **Estimating the budget:** In addition to the obvious costs related to ICT software and hardware, there is a range of costs related to human resources, for example, hiring new staff and training existing staff that normally have to be included in the overall budget for the digitalisation journey. Annex B includes a list of typical budgetary items of digitalisation projects.
- **Planning the funding:** Digitalisation is a long term process that is likely to span multiple financial years. Most year-to-year tax administration budgets will not allow for the scale of investment that is required for a digitalisation journey, so the digitalisation budget may have to be partially or wholly covered by additional funding. Although the cost estimates may be uncertain, the dialogue with the additional funders should start at this early stage based on the preliminary estimates, and then continue as the projects are being mandated and cost estimates become more accurate. Beyond the internal budget, tax administrations might want to consider the following funding opportunities:
 - It may be possible to partially or fully finance the digitalisation project with funding from the ministry of finance or other ministries. The administration can make this more attractive to the prospective governmental partners by looking for opportunities to partner with other departments who might benefit from the tax administration digitalisation.
 - Public-Private Partnerships (PPPs) are sometimes used to fund tax administration digitalisation. For instance, in Ghana, a PPP financed the new Revenue processing system for the Ghana Revenue Authority as part of the Ghana Electronic Government project. (Owusu, 2014^[21]) Although a PPP between a tax administration and private enterprises can be used to provide new skills or other advantages more readily available in the private sector, the most common use of PPPs is probably partial or complete funding of the digitalisation project.¹¹ Administrations considering PPPs should ensure that they retain all ownership to data in systems being developed through the partnership; there are cases where an external vendor has claimed ownership to taxpayer data stored outside the administration.¹²
 - A developing country tax administration may be able to benefit from the resources provided by bilateral or international organisation capacity building operations.¹³ If donor support is on the administration's list of potential sources of funding, the requirements and conditions that follow with the funding should be considered in the strategy.
- **Managing the finances:** In preparation for the strategy being enacted; the administration needs to ensure that necessary routines are in place for maintaining strict financial control, and for ensuring that financing is in place before the start of every project delivering on the strategy.

Box 3.4. explains how the Chilean Tax Administration has been able to introduce an electronic invoice portal for the small and medium business market with the help of donor funding and a public-private partnership.

¹¹ Additional advice on how to govern PPPs can be found in (OECD, 2012^[71]).

¹² Source: Confidential interview with tax administrations and researchers, 2021.

¹³ 76% of the World Bank Group's tax-related Investment Programme Financing for Fiscal years 2015-2021 was used to finance ICT systems. Source: WBG Presentation in ATAF/FTA Workshop 29.4.2021, available here: <https://oecd.org/tax/forum-on-tax-administration/publications-and-products/World-Bank-Group-Workshop-presentation-202104-ICT-Funding.pdf>.

Box 3.4. Chile: Donor funding and public-private partnership

Development and use of the Electronic Invoice Portal for Micro, Small and Medium Enterprises

An important project carried out by the Chilean Tax Administration (SII) was the development of the Electronic Invoice Portal for Micro, Small and Medium-sized Enterprises (Mipyme), whose objective was to contribute to the competitiveness of these enterprises through the use of technological management tools and information and communication technologies (ICTs).

This project was carried out thanks to a public-private alliance, in which different actors in addition to the SII participated:

- the Inter-American Development Bank (IDB) provided financial resources;
- the Chilean government participated in the implementation;
- the work was coordinated with the main Mipyme trade associations; and
- the main large companies in Chile contributed to the project as exemplified below.

As part of the implementation strategy, a project steering committee was created, composed of Mipyme trade associations and the SII, which submitted biannual financial reports to the IDB.

The SII was in charge of the construction of the Mipyme Portal. This portal is free of charge to Mipyme and allows companies to issue electronic invoices and other electronic tax documents. The portal offers access to a simplified and a complete accounting system.

To facilitate the use of the portal, the Mipyme trade associations set up information centres with free access throughout the country, where taxpayers were shown how to register on the Portal, install their digital certificate and issue electronic invoices.

In coordination with the SII, the 12 largest Chilean companies (from the commercial, productive and mining sectors), under "Corporate Social Responsibility" programmes, supported their Mipyme suppliers in the adoption of the SII's Free Electronic Invoice, providing free training, delivering hardware, digital certificates and, giving them preference as suppliers if they issue electronic invoices.

In 2007, the project began with 12 Mipyme. By 2014, there were more than 110,000 taxpayers using the Portal, and by 2020, more than 1 million. Since 2018, all invoices have been issued electronically, as have almost all other tax documents, with more than 566 million electronic documents being issued by 2020.

Source: Email from the Chilean Tax Administration (SII), October 2021.

Governance and transparency arrangements

The strategy should be sustainable in the long term to ensure lasting digitalisation effects. One of the factors influencing sustainability is the **governance arrangements** related to strategy revision:

- The strategy should contain provisions for when and how it will be approved and revised, for instance every other year and upon completion of each digitalisation deliverable.¹⁴
- The team developing the strategy should consider which stakeholders to consult during strategy revision; the range of consultations may not be as extensive as during strategy creation¹⁵, but key stakeholder groups affected by the revised strategy may be able to give valuable input.
- If possible, the governance of the strategy should be designed to last across changes in government. This principle may for instance influence the choice of strategy governance including the person or persons formally approving the strategy, and budget contributors.
- The strategy should be sufficiently mandated to withstand resistance from those with particular interest in the current situation. A broad and high anchoring of the strategy is therefore preferable.

Another crucial success factor for a sustainable strategy is **managing risks** related to its objectives and deliverables. Governance arrangements therefore should include clear instructions about how potential strategic risks are to be anticipated, discovered and mitigated.

The digitalisation strategy should outline guiding principles ensuring that the **core functions** of the administration are maintained throughout the process; the work of a tax administration has to continue during the digitalisation journey. Consequently, business continuity arrangements should be considered, and the digitalisation strategy should make sure that staff allocation to digitalisation projects do not negatively impact core tax administration tasks. This may mean that allocating temporary staff as replacement for those allocated to projects has to be considered.

Specifying **transparency measures** related to the digitalisation process in the strategy may give positive effects on many fronts. They will probably increase goodwill among taxpayers towards the tax administration - which in turns improves voluntary compliance; and they will most likely also have a positive effect on efforts to secure funding from external donors. The digitalisation strategy should therefore include a description of planned transparency measures. These might include regular updates on key figures related to the projects delivering on the strategy, as suggested in Figure 3.3., as well as work arrangements and principles for transparency in ICT systems.

Figure 3.3. Suggested key figures related to transparency measures

Cost vs. budget
Progress vs milestones
System reliability
Solution take-up
Benefits realisation
Effect of efficiency measures
Level and type of taxpayer complaints

¹⁴ An OECD study of governance of digital government strategies found that high level revision of the strategy goals usually occurred once or twice a year. (OECD, 2020^[66]).

¹⁵ Further information on this can be found in Annex B.

The strategy should also outline how to publicise the measures; making them known to taxpayers, administration employees and other government entities ensures that they give optimal effect.

Transparency measures should not only be in place for the deliveries from digitalisation projects; they should also target the projects themselves. For instance, there have been cases where procurement processes have derailed due to corruption, and the administration should ensure that this does not happen.¹⁶ Establishing processes for transparent and secure financial transactions in the digitalisation projects should therefore be described in the digitalisation strategy.

¹⁶ The administration can minimise this risk by doing a self-assessment of the procurement system or asking an external partner for an assessment, for instance using MAPS, and following up any undesirable findings. (OECD, 2021^[74]).

4 Managing strategy-aligned projects

Unless the projects delivered as part of the digitalisation journey align with the strategy, the objectives outlined in the strategy are not likely to be achieved.

Building a digitalisation strategy can be a significant investment in time and resources for a tax administration, yet it is considered essential as it lays the foundation for the practical work to follow. Similarly, unless the projects delivered as part of the digitalisation journey align with the strategy, the objectives outlined in the strategy are not likely to be achieved. This chapter, Annex C and Annex D offer observations and suggestions for managing digitalisation projects, to help ensure the maximum benefits are obtained.

It is likely that a single project will not get the administration to the end of the digital journey, though how many projects are needed depends on local circumstances. This chapter assumes that the administration only executes a single project at a time; whilst administrations may choose to execute several projects partially or completely in parallel, the principles set out in the chapter still apply.

In the context of managing strategy-aligned projects, it is possible to distinguish between the managers involved in preparing projects and those involved in managing the execution of a particular project, though the groups may be identical. For the sake of clarity, this report refers to the group preparing projects as the *management team* and the group managing the project as the *steering group*. Of course, administrations will often choose different ways of organising project work; for instance, tasks that this chapter and Annex C suggest should be the responsibility of the management team, some administrations may place in the steering group.

The chapter explores common activities for managing digitalisation projects, frequently executed in the order indicated in Figure 4.1.

Figure 4.1. Common activities for managing digitalisation projects



The suggested activities and their order may not work for all administrations and projects, and should be adapted as necessary. For instance, if the project manager is hired externally, it may be more appropriate to select the person at a later stage.

Choosing the project manager

Choosing the right project manager boosts the chances of a successful project, and involving the project manager in the scoping and governance activities often benefits project quality by increasing the project manager's sense of ownership of the project and allowing the project to profit from the project manager's previous experience. Subject to local conditions, it may therefore be advisable to select the project manager before moving on to other preparation tasks.

In selecting a project manager it is important to consider the following:

- Project management is a profession with significant skill requirements and heavy dependence on earlier experience, and digitalisation projects can be fairly complex, so it is generally not advisable to add the project management role on top of any existing responsibilities. Allowing the project manager to focus solely on the project increases the chances for success.
- Ideally the project manager has formal training and up-to-date certification as well as a proven record of accomplishment from other projects corresponding to the expected challenges of the digitalisation project.
- Apart from considering project management skills and experience, the management team should seek to appoint someone with proficiency in both ICT and tax, since digitalisation projects within tax administration involve specialists from both areas, and the project manager is often the bridge builder between groups with different skills.

Box 4.1. Does the software development strategy matter?

While traditional software development strategy, sometimes referred to as waterfall methodology, is still being used in many tax administrations, research and interviews conducted for this report shows that agile methodologies are becoming increasingly common and popular. The same research and interview shows that while the quality of the project may matter more, the methodology may make a considerable difference. This topic is discussed further in Annex D.

Preparing project scope and governance

With the project manager in place, the management team can initiate the scoping and governance activities, including creating a mandate for the project, preparing for external collaboration, and if necessary identifying options for the core ICT solution on which digitalisation is based.

Whilst the project manager can prepare drafts and recommendations for the scoping and governance activities, the management team should oversee activities and take the final decisions in these matters.

From deliverables to project scope

The deliverables outlined in the digitalisation strategy form the foundation of the digitalisation projects, but sometimes the work involved in creating a single digitalisation deliverable may be divided into several

projects, and it may happen that several deliverables can be delivered with a single project. Consequently, the management team needs to decide, picking from the top of the prioritised list of deliverables, what should be included in the project being scoped.

In project management practice it is common to distinguish between *projects* and *programmes*; whereas projects normally have a defined start date, end date, scope and budget, a programme is usually a collection of projects working towards a common goal. As mentioned earlier, several projects are usually needed to complete the scope defined by the digitalisation strategy. By organising the deliverables in the strategy as a programme with a programme manager and several projects, the administration is more likely to ensure coherence across projects. The entire programme may be planned on a high level at an early stage, and the plans adjusted as projects are completed.

Preparing the governance model

Based on the agreed overall project scope, the management team, usually in collaboration with the project manager, creates the project governance structure and the project mandate.

It is common that the **project governance structure** includes a steering group, a project manager, possible sub-project managers, and possibly a level of team managers. The composition and responsibility of the steering group is of particular importance:

- The steering group leader is often called the *project champion*, because this person has the primary responsibility for the project and is looked to for decisions, motivation and guidance. It may be the Commissioner or a Deputy Commissioner, but the role may also be delegated to another top level tax administration manager. It is however crucial that the steering group leader can represent all parts of the administration affected by the project, not only a single division or unit.
- The other steering group members should be people with *special interest* in the project and sufficient mandate to make project-related decisions on behalf of their units.
- Many steering groups assign a role of *business owner* to one of its members; this can be a manager from the unit that will be most directly affected by the project deliverables, and the purpose of the role is to ensure that decisions made by the steering group are sufficiently informed by and adapted to the needs of the users of the deliverables.
- The *responsibility of the steering group* will be to oversee the project work and approve or reject suggested changes to project parameters like scope, time or budget. The project manager will report to the steering group.
- The *number of levels in the project organisation* should be decided on the basis of the project complexity, budget size and number of members, keeping in mind that multiple levels of project managers increases the bureaucracy and cost of the project.

An important success factor for successful projects, including those on digitalisation, is that the project manager has a clear and sufficient **project mandate**.¹⁷ It is common to see the mandate as a form of contract between the steering group and the project manager, setting out the framework within which the project manager will perform their work. Figure 4.2. illustrates common project mandate topics.

¹⁷ Several other terms are also used for the agreement between steering group and project manager; they are not used in this report, in order to increase readability.

Figure 4.2. Common project mandate topics

Background, context and motivation
Scope, timeframe, resources and other framework parameters
Cost-benefit analysis
Stakeholder overview
Communication strategy
Governance structure
Frequency and content of reporting
Regulations regarding project manager's authority
Rules for escalation from project manager to steering group

The mandate should be aligned with the digitalisation strategy, and content for some of the mandate topics can be based on similar material in the strategy, albeit adapted to the project context.

Preparing for external collaboration

Since collaboration with external public or private partners usually requires agreements beyond the scope of the project mandate, this collaboration should be prepared to ensure that planned external collaboration efforts harmonise with planned project activities:

- For **inter-governmental exchange of data**, a common success factor is ensuring that the other government institutions have necessary influence over processes that involve them. This will also go a long way in avoiding resistance from other government leaders that fear losing influence over their areas of responsibility. To ensure proper handling of financial, architectural and digital interface issues, clear frameworks for coordination between the government entities, for instance a joint task force, should be set up and described in the project mandate.
- For **private sector collaboration**, the project scope description should establish the big picture of collaboration and ensure that necessary legislation and agreements are in place. For instance:
 - Does the project depend on receiving data from private partners, sending data to private partners, or both?
 - Are there any pre-existing conditions connected with the collaboration that need to be described in the project mandate?

Selecting core ICT solution style: Build, buy or rent?

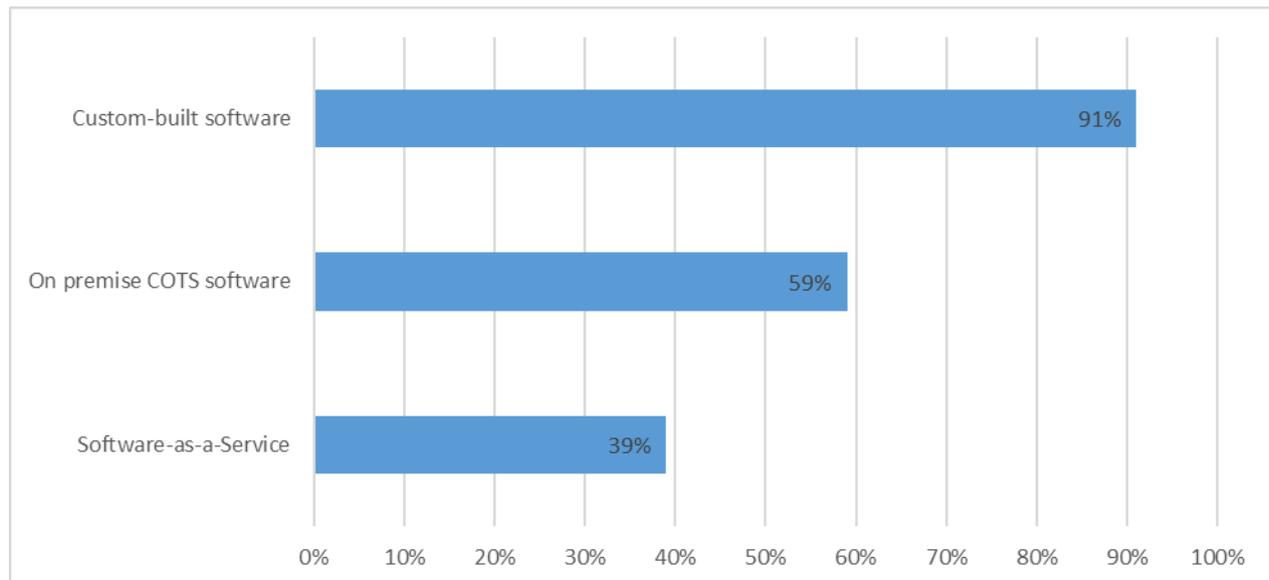
In digitalisation projects where the core ICT solution is subject to change, the choice of solution style is fundamental to project structure, duration, staffing and numerous other parameters, therefore also having an impact on the project mandate. The most common style choices can be summarised as building, buying or renting the software used in the ICT solution; the administration can:

- develop the software using in-house staff, an external team (through a procurement process) or both, often referred to as tailor-made software;

- purchase a pre-built software solution, often called commercial off the shelf (COTS) software; or
- rent software in a cloud solution where the cost depends on usage, often called Software-as-a-Service (SaaS).

As illustrated in Figure 4.3., all three options are regularly used in tax administrations, and it is fairly common to use a mix of them. The mix usually depends on the history of digitalisation in the administration, combined with strategic decisions.

Figure 4.3. Software used for operational ICT solutions



Note: 149 of the 156 ISORA 2020 participants responded to the relevant questions, for fiscal year 2019. According to the ISORA definition, Operational ICT solutions are used to fulfil the tax administration's mandate and include systems for registration, return processing, payment processing and auditing.

Source: (ADB, CIAT, IMF, IOTA, OECD, 2021^[22]). Calculations done by FTA Secretariat.

Some administrations may, depending on the local circumstances, consider hybrid options. For example:

- The administration may choose to modernise existing software instead of replacing it, if for instance the solution is based on an in-house built system and the existing software architecture allows for cost-effective changes.
- The administration may choose to buy COTS software components for the areas of taxation where the market is extensive and the selection plentiful¹⁸, and build the other components. For instance, debt collection systems are fairly common, and the administration can buy a COTS debt collection system and integrate it with a tailor-made system for the part of the collection process that is unique for tax administration. A crucial success factor for such solutions is that all components can integrate seamlessly and with relatively low effort.

The following table summarises some common characteristics, including the advantages and disadvantages of the three common choices. The table should not be regarded as sufficient basis for decision-making; other factors and local conditions should also be considered. Further discussions on these and other characteristics, as well as other factors for consideration, are covered in Annex D.

¹⁸ Such software package combinations are often called best-of-breed solutions.

Table 4.1. Some common characteristics of Build, Buy, Rent

	Build	Buy	Rent
Initial cost	<ul style="list-style-type: none"> • High investment cost, and the cost level is sometimes unpredictable • Configuration may be costly 	<ul style="list-style-type: none"> • High investment cost, but the cost is normally predictable • Configuration may be costly • Customisation may be costly • May have to pay for unused functionality which is automatically included 	<ul style="list-style-type: none"> • Low investment cost • Configuration may be costly • Customisation may be costly if available
Operational cost	<ul style="list-style-type: none"> • Operational cost depends on implementation 	<ul style="list-style-type: none"> • Operational cost depends on implementation, but is normally predictable 	<ul style="list-style-type: none"> • Operational cost depends on use – usually higher per user than the other options, but is normally predictable
Upgrades	<ul style="list-style-type: none"> • Upgrades incur software development cost 	<ul style="list-style-type: none"> • Upgrades are normally made available by the vendor, but have to be installed by on-site staff • Upgrades are usually paid with a fixed yearly maintenance cost • Customisations may have to be manually adapted to the upgrade 	<ul style="list-style-type: none"> • Upgrades are usually done without any technical effort from the administration, but other work related to upgrade may be needed. • Upgrade cost is normally included in the operational cost. • Customisations, if available, may have to be manually adapted to the upgrade.
Functionality	<ul style="list-style-type: none"> • Only includes necessary functionality • Usually adapted to the administration's business processes • Depending on implementation, the system may be flexible with regard to future changes and extensions 	<ul style="list-style-type: none"> • Usually offers a range of modules with specific functionality and options for including more by paying more • The administration may have to change business processes to adapt to the system 	<ul style="list-style-type: none"> • Usually offers a range of modules with specific functionality and options for including more by paying more • The administration may have to change business processes to adapt to the system

	Build	Buy	Rent
		<ul style="list-style-type: none"> Solutions usually support what is considered best-practice for tax administration processes Customisation is often possible but not recommended 	<ul style="list-style-type: none"> Solutions usually support what is considered best-practice for tax administration processes Usually limited or no room for customisation
Vendor dependence	<ul style="list-style-type: none"> May be relatively vendor-independent 	<ul style="list-style-type: none"> High vendor-dependence 	<ul style="list-style-type: none"> High vendor-dependence
On-site ICT staff requirements	<ul style="list-style-type: none"> Requires maintenance staff after roll-out 	<ul style="list-style-type: none"> Requires maintenance staff after roll-out 	<ul style="list-style-type: none"> Reduced need for on-site ICT staff compared with other options
On-site ICT system requirements	<ul style="list-style-type: none"> Normally requires on-site hardware to run the system 	<ul style="list-style-type: none"> Normally requires on-site hardware to run the system 	<ul style="list-style-type: none"> Normally requires minimal on-site hardware; system is running off-site
Test considerations	<ul style="list-style-type: none"> The administration is responsible for testing 	<ul style="list-style-type: none"> Vendor delivers tested software, but the administration must test local installation and configuration 	<ul style="list-style-type: none"> Vendor makes available tested software, but the administration must test its own configuration
Risk considerations	<ul style="list-style-type: none"> There may be higher risk of software errors, but error correction is done in-house 	<ul style="list-style-type: none"> For standard functionality, there is normally reduced risk of software errors; error corrections are done by vendor according to their schedule 	<ul style="list-style-type: none"> For standard functionality, there is normally reduced risk of software errors; error corrections are done by vendor according to their schedule
Other considerations	<ul style="list-style-type: none"> Requires considerable ICT staff with knowledge of best practice for taxation software and processes during development 		<ul style="list-style-type: none"> Legal restrictions in some countries

Note: This cannot be used as the sole basis for choice; other factors as outlined in Annex D, along with local conditions and special circumstances must be considered. The general characteristics in each case are based on the assumption that contract and implementation are done according to best practice.

Source: FTA Secretariat.

Preparing the project plan

With the mandate established, the project manager can start developing the project plan. The work will be overseen by the steering group and often be done in collaboration with appropriate specialists, for instance within IT, change management and tax administration operations.

Working on the project plan is not only a project preparation task. The plan is likely to be adjusted throughout the project as new challenges or priorities emerge. Nevertheless, it is advisable to produce an outline of the project plan early in the planning process, in order to get an overview of the known information as well as what is not yet known. The skeleton version of the plan may also be useful for coordination between steering group and project manager.

As a minimum, the digitalisation project plan should include the following:

- **Governance structure**, as determined by the management team.
- **Resource** roster organised by time; this should allow for scaling up and down of resources at the appropriate times.
- **Timeline** including milestones and project deliverables as necessary.
- **Work breakdown structure (WBS)** which divides the work to be done in the project into a hierarchy of smaller units. If possible, the more detailed levels of the WBS should be created close to the time of completing the work, in order to reduce the number of changes.
- **Running cost overview**: Estimated cost for outstanding work and purchases as well as actual cost for completed work and purchases, compared with the project budget.
- **Stakeholder** overview and communication plan organised by stakeholder.
- **Cost-benefit analysis**, possibly based on the analysis from the project mandate.
- **Risk management strategy** including an initial risk analysis, possibly based on the analysis from the project mandate.

Annex C and D contain more observations on topics related to building a project plan, including project governance structures, recommendations for specific topics like the cost-benefit analysis and risk management, as well as a discussion of a range of ICT aspects that may have to be considered.

Preparing for change

Change management is at the heart of successful project delivery. In large or complex projects it may even be necessary to appoint a change manager to handle organisational and process changes, in order to allow the project manager to focus on project parameter changes. Regardless, digitalisation projects usually result in some administration tasks disappearing or being drastically reduced in scope while others are added or increase in scope, and this requires careful planning. Without a change management plan, resistance to the changes can emerge, with concerns often rooted in worries about job security for existing staff. This is a sensitive topic, and transparency and involvement is critical to ensure that staff remain motivated, can see the opportunities for personal growth, and support the changes digitalisation brings.

Training plans in particular need to be synchronised with the change management plans, and the tax administration may hire people to train their staff, seek external training, or a combination of these. It is important to retain digitally skilled staff in order to ensure long term success for the digitalisation programme; the administration may want to consider retention programmes to help keep staff who have received specialist training.

To save cost and time, the administration can consider looking for relevant online training. A fairly recent addition to this type of capacity building is the Virtual Training to Advance Revenue Administration

(VITARA) initiative. This is a collaborative effort of the Inter-American Center of Tax Administrations (CIAT), the International Monetary Fund (IMF), the Intra-European Organisation of Tax Administrations (IOTA) and the OECD.¹⁹ Courses available at the time of writing include:

- Reform Management Specific Topics - Managing A Reform Program
- Reform Management Fundamentals - Setting Up a Reform Program
- Strategic Management Module

Digitalisation can lead to wider **organisational changes**, and a complex aspect of change management is adapting the organisation to the new situation arising from digitalisation. Issues frequently include:

- Wherever possible, the tax administration management should consider *training and reallocating* staff rather than searching outside the organisation for the necessary skills. This will be helpful in increasing motivation and support for the changes as well as for the retention of valuable experience in the organisation.
- When the only available option is hiring new staff, the *number of new positions* should be scaled according to estimated need. Though it may seem pertinent to limit the number of new positions in order to save money, some tax administrations have discovered that this works to their disadvantage. For instance, an administration introduced Analytics in order to make better use of its data and reach more accurate decisions, but due to too few people being capable of using the new system, the large investment in Analytics services was largely wasted.²⁰
- Digitalisation may require that the organisational change management is *adapted to local circumstances* in different parts of the jurisdiction. With significant diversity in responsibilities and skills between staff in different areas (for instance marked by rural vs. urban characteristics), motivational factors may vary across the administration.

Introducing ICT-support to a process most likely requires the **business processes to change**. By omitting business process redesign and using the old processes with the new ICT system, the administration at best risks losing some benefits from digitalisation and in the worst case, the discrepancy between processes and ICT system support can lead to failed projects. A research team studying the introduction of core ICT systems in 13 developing countries discovered that lack of business process redesign was one of the most cited reasons for failures. (ITC, 2015_[23])

The business process redesign should be aligned with the administration's overall strategy and the digitalisation strategy, in order to ensure that all processes develop the administration in the same direction. The redesign should involve administration staff, even in the cases when external expertise is used for the redesign process, to ensure necessary local taxation competence and increase internal support for the new processes.

Based on information about current legislative limitations and prerequisites for achieving the project goals, the team preparing the project should plan the dialogue with lawmakers in order to increase the probability of **timely legislative changes**. The team should also prepare alternative plans if the legislation is not in place in time. This activity requires collaboration between the administration's legal department, the project's legal team and the project manager. Some administrations choose to proactively advise the ministry on how to create digitalisation-friendly legislation.

¹⁹ The secretariats of the four organisations (and in the OECD case: the FTA Secretariat) can supply more information about the training. Information about current offerings as well as how to access the training is available through IMF's training catalogue at <https://www.imf.org/en/Capacity-Development/Training/ICDTC/Search> by using the search keyword vitara.

²⁰ Source: Confidential interview with a tax administration.

Preparing for roll-out

An effective roll-out has significant impact on the success of the project. The project manager should therefore plan the roll-out process as part of the project preparations and seek approval for the roll-out strategy from the steering group. This is because the roll-out interconnects with training, change and communication plans and all these items combine to deliver an effective rollout.

It is common to organise the roll-out in *stages*, making the new solution available to a limited group at a time.²¹ Based on the experience from each case of roll-out, the plan for the subsequent stages can then be adjusted, and if the current roll-out stage uncovers needs or opportunities for changes to for instance software, processes or task allocation, this can be done before the next stage. Common roll-out principles include size, sector, geography, tax type and optionality.²²

- Size: The largest business entities can start using the new solution first, since these entities usually have the most comprehensive compliance programmes.
- Sector: One particular sector or industry at a time can start using the new solution.
- Geography: The solution can be introduced to one geographical area at a time.
- Tax type: Some digitalisation solutions may be introduced by tax type.
- Optionality: The new solution can be introduced as optional, with a transparent plan for making it mandatory for most or all taxpayers with time, based on some form of grouping like size or sector.

The *plan for external communication* associated with roll-out is probably almost as important as the roll-out plan itself: To increase uptake in the use of new digital tools and services, it is important to make taxpayers aware of them and convince them that it is to their benefit to use them. Taxpayers may also need time to prepare and any communication plan should take this into account. For instance, businesses being informed of future changes to digitalised tax processes can plan their software replacement or upgrades accordingly. Common techniques for promoting digital solutions include:

- Producing videos that promote the new solutions and how to use them. They can for example be made available via internet platforms or on the tax administrations website.
- Producing targeted communication via printed materials such as leaflets or posters, or through digital channels.
- Building demo-versions of new tools and services that can be used by the taxpayer population, and making these available before roll-out to raise awareness and allow taxpayers to prepare.
- Involving tax intermediaries in communication campaigns.

It is also important that the plan has clear success criteria for the roll-out. For instance, when launching a new mobile app, the roll-out plan should include goals for number of downloads or the number of accesses within a certain timeframe, so that it can be measured whether the launch and the corresponding communication campaign have been successful.

Box 4.2. shows how the Indonesia Directorate General of Taxes assist their taxpayers with the transition from traditional to digital services.

²¹ This differs from prototyping and piloting, discussed in Annex D.

²² For more information on this, see for instance (ICAEW, 2019^[29]).

Box 4.2. Indonesia: Preparing taxpayers for digitalised services

In Indonesia, the Directorate General of Taxes (DGT) has gradually switched to online-based services to replace previously manual reports and services, such as the transition from manual tax filing to e-filing, manual tax invoices to e-invoices, manual tax payment slip to e-billing, online TIN registration to e-registration, and other services. To assist taxpayers in using these services, DGT makes video tutorials which are regularly updated to follow the development of services. These videos can be easily accessed by the public through DGT's YouTube channel.

In addition, units at DGT also organise tax classes, with different themes such as filling out tax returns through e-filing and using e-invoices. Since the start of the COVID-19 pandemic, tax class activities that were previously held face-to-face have been shifted to online tax classes which are publicised through the administration's webpage and its social media accounts.

Source: Document received from the Indonesia Directorate General of Taxes, February 2021.

Project execution

Between project preparation and project execution lies the important “*Stop/Go*” decision. This is frequently taken by senior leaders once all the required elements are in place, risks have been considered and if possible mitigated, and the project is ready. The decision is critical because regardless of how much money, time and resources have been spent on the planning phase, it will be better to stop a project before execution if it is likely to fail. In most cases, the effort spent on planning a project that does not go to execution will be useful for building experience, improving the success rate of future projects.

Once the Go-decision has been taken, the success of the execution phase hinges on *continued strong support from top management* just like with the previous phases. For instance, some administrations report struggling to replace paper-based processes with ICT-supported alternatives because of resistance from middle managers. Unless senior managers are clear that the change must involve management and staff at all levels, middle managers may choose to retain their previous processes, resulting in suboptimal or even failed introduction of new solutions.

A key characteristic and advantage of the project model is that it has a clear start date, end date and scope. Although *the end date and the scope may be adjusted* through steering group decisions along the way, it happens that there is still outstanding scope to complete when the end date is approaching. In such cases, the steering group should ensure clear boundaries and frameworks for the project manager, to avoid projects continuing past the end date without a clear agreement. Common measures in this regard can be deciding to take scope out from the project, handing it either to a line unit or another project, or mandating the project to continue until a later end date.

A successful project also requires carefully planned and executed *project closing activities*. This is the responsibility of the project manager but should be overseen by the steering group, and include handover of responsibility for deliverables from the project, handover of outstanding project responsibilities, and a careful evaluation of project processes and results to ensure optimal learning effects. These topics are revisited in Annex C.

Post-project follow-up and monitoring

The full benefits of the digitalisation project often only materialises after the project has launched. It is therefore important that systems are put in place to ensure that **results are monitored** and feedback loops identify areas where expected benefits are not being delivered as intended. These feedback loops can also be useful for demonstrating that the project has achieved its goals and benefited the taxpayers and the administration as intended, helping to build the case for future projects.

By planning the **monitoring and follow-up measures** well before the end of the project, the administration ensures that appropriate measures are in place when the project concludes, ensuring full benefits of the digitalisation efforts. Key features of these measures include:

- They are well structured to ensure clear assignment of tasks and responsibilities.
- They monitor benefits yet to be realised until these come to fruition.
- They ensure that remaining project tasks are assigned to the right people for completion, with monitoring and evaluation processes in place.
- They include reporting and escalation mechanisms as appropriate.

To ensure continued successful use of the ICT solutions introduced by the digitalisation project throughout their intended lifetime, the solutions must be supported by a **maintenance and upgrade plan**:

- Changes in technology, society and legislation may offer new opportunities for more efficient and effective ways to use the solutions through upgrades. The changes may uncover challenges which, if unmet, may have significant negative impact on the usage of the solutions.
- Administration staff and taxpayers may uncover opportunities for improvement through their daily use of the solutions, and challenges that need to be met in order for the solutions to continue to function.

Consequently, the management team should ensure that continuous maintenance and upgrade of the new solutions is clearly mandated, assigned to staff and supported by the appropriate budget.

Part III. Examples and assistance



Assistance from other tax administrations and organisations may provide a different perspective on issues and help challenge existing ways of thinking.

Tax administrations are tackling the challenges of digitalisation in different ways, depending on their individual situation, needs and priorities. Although there is no one size fits all approach to a digitalisation journey, administrations can still benefit from the experience of others, and identify pieces of key learning that might help their individual journey. Assistance from other tax administrations and organisations, often based on specific expertise within a particular area, may provide a different perspective on issues and help challenge existing ways of thinking. All this is critical to effective digitalisation projects as it can help accelerate work and avoid common pitfalls.

As digitalisation is a high priority area for many administrations and organisations, there is a wealth of external expertise, experience and advice available to tax administrations. This part of the report aims to highlight some of that experience and assistance.

Chapter 5 concentrates on what is often the most valuable source of assistance – learning from the experience of other tax administrations in frequently targeted areas of digitalisation. This is especially useful as it is based on first hand practical experience, and so this chapter contains numerous case studies that have been supplied by tax administrations.

Chapter 6 highlights the viewpoints of regional tax administration organisations and other regional organisations across the globe, the specific challenges of digitalisation in their regions and how they may be able to assist. This assistance can be very valuable as it can provide a regional perspective on issues and access to advice that takes into account specific local requirements.

There are also numerous internationally developed tools, frameworks and offerings which can help tax administrations gain insight into their current strengths and weaknesses, get additional perspectives on the context in which they operate and identify potential strategic objectives for digitalisation. Chapter 7 summarises some of the currently available sources of support.

Regardless of the choices made with regard to assistance, many administrations contributing to this report have remarked on the importance of the external partner gaining sufficient insight into the specific situation in the administration and the jurisdiction in which it operates before offering any kind of advice. It has been noted that if the external partner started suggesting digitalisation plans based on previous experience alone, the results tended to be unsuccessful. The process of understanding the local context can take time, and it is important that the project plan allocates sufficient time for the external partner to 'immerse' themselves in the requirements of the host tax administration.

5 Frequently digitalised areas

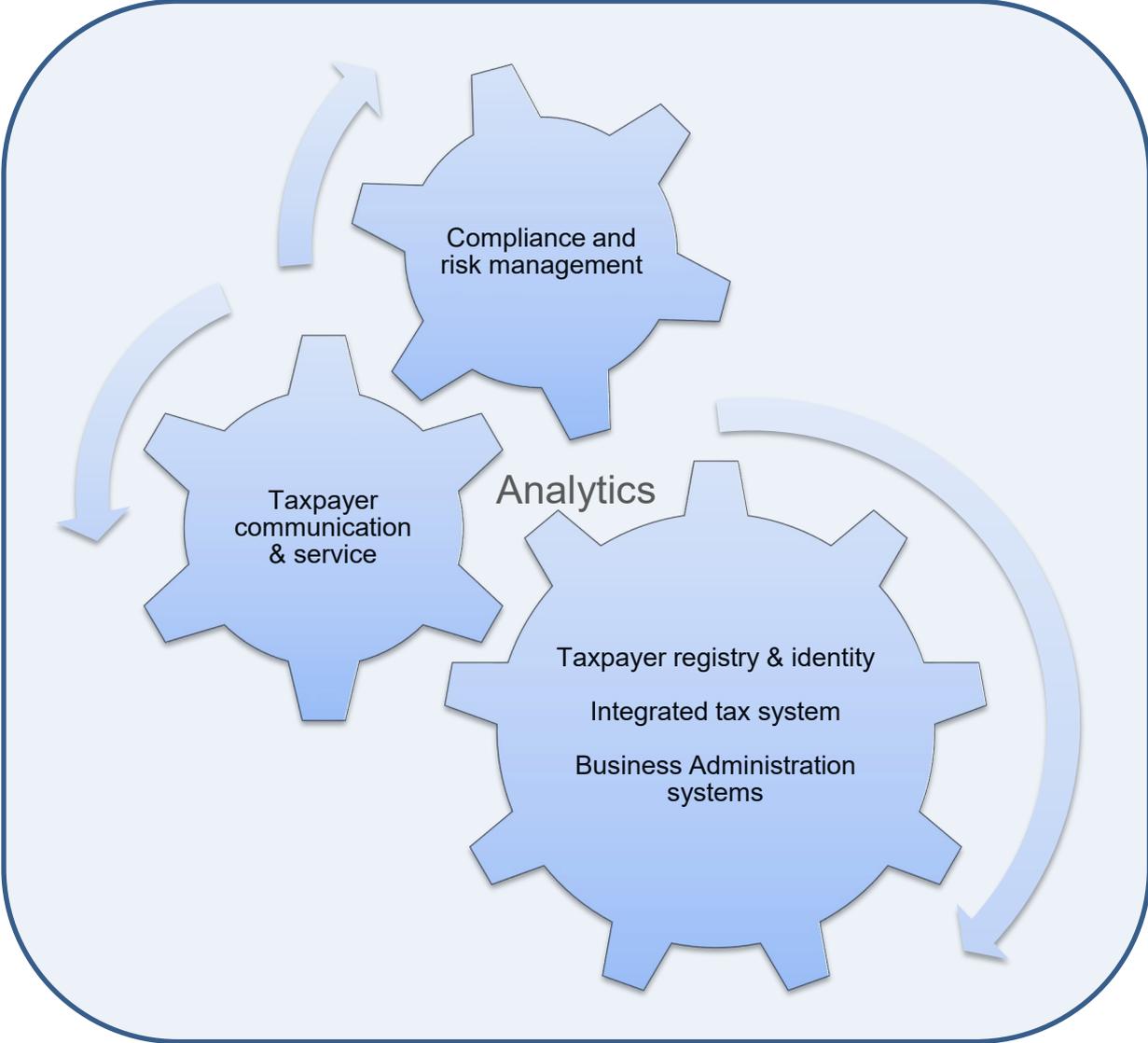


Given the many distinctive starting points and priorities within different countries, individual digitalisation journeys will always vary. However, the end goals are the same - to deliver a better service to taxpayers and raise more revenue, by increasing a tax administration's efficiency and effectiveness. These common ambitions mean that by analysing different tax administration's digitalisation journeys, areas can be identified that tax administrations frequently target for digitalisation as they are essential to meeting their ambitions.

The frequently targeted areas identified and described in this chapter are illustrated in the cogs in Figure 5.1. Although each area usually can be considered for digitalisation independently of the others, the areas over time come together and interlock to form the core of a digitalised tax administration. All this work is supported by Analytics, supplying insight to other areas.

There is a suggested prioritisation illustrated by the cogs. It is common amongst tax administrations to start with the areas identified in the large bottom cog, as they form the basis of a digital administration that can contribute to the areas in the smaller cogs. Ensuring that the digital registry is in place and that all core tax functions as well as business administration are digitally supported before moving outwards to offer optimal digital taxpayer services or exploring further digitalisation opportunities in compliance and risk management, is therefore often advisable.

Figure 5.1. Areas frequently targeted for digitalisation



Box 5.1. The importance of data security and privacy

Data security and privacy is arguably crucial to all digitalised areas, and is therefore given special consideration before the areas are studied. Tax administrations operate in an area of increased risk of breach of legislation related to data storage and use, whether due to intentional hacking attempts or mistakes by taxpayers, staff or managers. Any digitalisation deliverable therefore has to be equipped with a consistent and comprehensive framework of security and privacy, in order to uphold legislation and protect taxpayer information.

This framework should cover every layer, from physical protection of servers, workstations and network via software with security and privacy principles built-in to security- and privacy-conscious staff and managers. This last layer of protection should be given particular attention through training and awareness campaigns: Some security experts claim that three out of four primary means of digitally based attacks are through people's choices, for instance through phishing for credentials, password guessing and malicious email attachments.

To ensure the necessary staff, governmental and societal buy-in to digitalisation and achieve the intended prevalence of the new solution, the planned security and privacy framework should be clearly communicated; the different stakeholders, and in particular the taxpayers, have to feel confident that all information is going to be securely stored and only made available as legislated.

Appropriate privacy measures sometimes go beyond what is required by legislation: Even if a particular use of data is legal in a jurisdiction, it may not be ethically or societally acceptable; using the data may damage the tax administration's image and hamper voluntary compliance. The Swedish Tax Agency (STA), in its work to obtain good information management and data governance within the STA, have found it useful to answer the following in regards to the handling of information:²³

- what are we allowed to do;
- what can we do;
- what should we do?

For further recommendations regarding data security and privacy, see Annex D.

Source: FTA Secretariat.

Taxpayer registry and identity solutions

The digital taxpayer registry commonly constitutes the foundation of digitalisation of all other taxation functions. It is intrinsically connected to a digital taxpayer identity solution which can uniquely identify the taxpayer and allow secure taxpayer access to information and services. Thus, although a taxpayer registry and the identity solution are different components, they are normally considered integral parts of the foundation for a successfully digitalised tax administration.

The **taxpayer registry** keeps track of individuals and businesses that either are or should be taxpayers, or that have other relations with the tax administration, for instance as third party data providers. Given its central role in relation to tax administration processes, it is common to ensure that the registry is continuously maintained and updated.

²³ Source: E-mail from Swedish Tax Agency, October 2021.

The taxpayers are identified with some form of unique taxpayer identification number, and registry information usually includes contact information like phone numbers, email addresses and physical addresses. For individuals it is also common to register personal information like date and place of birth and personal relationships. For businesses, it is common to include information regarding type of business, date of establishment, taxpayer segment and corporate relationships.

Some registry information is bound to change with time, and an individual or business may have many simultaneous roles in relation to the administration. Consequently, some form of date-limited role register is necessary, to take account of the many different scenarios such as those outlined below:

- A business may require different roles to account for the fact it is paying CIT and VAT, withholding and paying PIT on behalf of its employers through PAYE, supplying third-party information for tax return prefilling, and being the parent company of other companies.
- An individual may be paying PIT and Property tax, be an employee of a company, be a board member in another company and a stockholder in a third company, and have family relations with other individual taxpayers.
- An intermediary may be acting for another taxpayer as well as being a taxpaying business or self-employed individual taxpayer.

Information either directly available in the registry or indirectly available through integration with other tax systems defines the taxpayer's status as active or inactive and shows filing and payment obligation status. Consequently, the registry is central to other solutions, such as the comprehensive taxpayer view discussed in the next section.

With a **single identity** solution, the taxpayer will be represented with a single identity throughout all tax systems and processes, and can identify themselves using this identity in order to access sensitive taxpayer information and services. Adding the term **digital** implies that the solution can be used for electronic rather than physical information and services.

Some choose to distinguish between a *digital ID*, the set of credentials used to identify a person, and a *digital identity*, the digital set of attributes also referred to as the digital twin of the person, representing the person in the digital realm. This report takes a simpler approach, using *digital identity* to include both sets of information, and assuming that a subset of the digital identity is used to identify the person.

In an ICT context, the term *identifier* is usually also used to represent the item of information used as the common key across all tax systems. It can for instance be the national identity number or the taxpayer identification number.

The solution for granting access commonly includes three stages:

- **Identification:** In this stage, the taxpayer presents information for identification. In its simplest form, this can be stating their name orally for voice identification. The information used for identification can for instance be the taxpayer's national identity number, taxpayer identification number, or a biometric marker like voice print, retina print or fingerprint.
- **Authentication:** This stage is used to confirm that the taxpayer is who the identification claims that they are; it may include passwords, biometric verification such as voice or face recognition or time-limited codes. When the identification is non-biometric, two-factor authentication is often used to improve security. The two factors can for instance be something the taxpayer knows, like a password; and something the taxpayer has, like a device generating a time-limited code or a mobile phone which can receive a text message.
- **Authorisation:** This is the final stage where the identified and authenticated taxpayer is given the authority to access a particular set of services.
 - Some services may include making changes to information while others only allow the taxpayer to see information.

- In some cases, the taxpayer will have to indicate who they represent after authentication, in order to be given the right authorisation. For instance, a person working as an intermediary may be able to represent themselves after login using the authority given to them as a taxpayer to access their personal information, or represent another taxpayer using the authority as intermediary for access to the client's information. Similarly, a person can represent themselves or a taxpaying company.

Although the tax administration primarily uses the digital identity solution to identify taxpayers, it can also be used to identify other individuals with a tax administration relationship, like financial institutions or businesses supplying third-party data. Similarly, identity solutions are commonly cross-governmental or cross-societal, meaning that the individual uses the same method of identity across all governmental services or societal services respectively.

Taxpayer registry solutions: Benefits

Since the taxpayer registry is central to all tax administration responsibilities, it follows that all parts of the administration as well as the taxpayers benefit from it:

- By investing in a complete and comprehensive taxpayer registry, the administration ensures that all parts of the organisation use the same correct taxpayer information. This leads to increasing efficiency and effectiveness of manual as well as automatic processes and enables the administration to take a taxpayer-centric approach in its processes. Correct taxpayer information will often also improve the quality and reduce the cost of compliance verification, and a registry complete with all taxpayers will help ensure a broader tax base.
- For taxpayers, it is beneficial that the administration maintains complete and correct information about them in order to provide the correct and necessary services and avoid asking repeatedly for the same information. The registry will also aid in ensuring uniform treatment of taxpayers.
- By allowing taxpayers to register electronically, the tax administration can offer more flexible taxpayer services, which can help drive up compliance. It is also likely to improve transparency and mitigate the risk of face-to-face contact between taxpayers and tax officials leading to illegal transactions. Finally, it is likely to increase taxpayer satisfaction for those who can register from a computer or mobile phone instead of having to travel to a tax office.

Taxpayer registry solutions: Key considerations

Arguably the most critical feature of the registry is the *unique taxpayer identifier*, which should be used across all tax systems in order to ensure integrity and data quality. The identifier design should therefore be given careful consideration: A successful identifier is simple, preferably a single attribute, and does not change with time. Using combinations of existing taxpayer information like name, birthdate and birthplace is not considered best practice. Similarly, using information like address or country of residence is likely to create problems when taxpayers move.

The registry should have *automatic routines* for central tasks in order to save manual maintenance. For instance:

- There should be an automatic routine for creating and maintaining taxpayer roles and relations, which also should search for and report any potential duplicate entries for manual resolution, as well as flagging any seemingly dormant registration for manual or automatic treatment.
- Likewise, there should be a routine for automatic deactivation or deregistration of information; this should be integrated for the solution for archiving information, and possibly deletion if this is required by national privacy legislation. The routine should be complemented with a manual process for exceptions.

- The registry should be set up for automatic updates from other official registries with ownership of some of the information. For instance, a people's registry may be responsible for registering physical address and family relationships; when such information in the people's registry is updated, the taxpayer registry should automatically be updated as well.

The administration should ensure that the register is *as complete as possible*, with all those registered that should be, businesses as well as individuals. This can help in work to broaden the tax base, increase taxpayer compliance motivation and lay a good foundation for increased revenue.

The registry should allow for *electronic registration of taxpayers*, for instance through a taxpayer portal or a governmental services portal. This registration solution should be considered in relation to other electronic services, so that even if only one service is implemented at a time, they all integrate seamlessly once implemented.

Taxpayer identity solutions: Benefits

Digital identity solutions not only benefit tax administrations, but can also lead to wider benefits across government, across society or internationally:

- From a tax administration point of view, when the same unique taxpayer identifier is used for all taxpayer records in all tax systems, operational costs are reduced, the administration can operate more efficiently, and fraud attempts are easier to detect. Furthermore, allowing the taxpayer to securely identify and authenticate themselves before gaining access to tax systems increases security.
- For the taxpayer, knowing that access to their data is only available after secure identification and authentication increases the level of trust and is likely to improve their satisfaction with the tax administration.
- When the same identifier is used across all government sites²⁴, the tax administration benefits from higher quality data from external sources, while the taxpayer is able to use the single method of identification and authentication everywhere, reducing operational cost and increasing taxpayer satisfaction. Ideally, the shared identity solution is combined with shared governmental portals, so that the taxpayer only has to log in once to access information and services related to different government agencies.
- When the identifier is used across the entire society including the private sector, so that third party data and other relevant information is linked directly and uniquely to the taxpayer, the tax administration benefits with regard to operational costs, efficiency and compliance are further increased. Similarly, life for the taxpayer is simplified by being able to use the same solution for identification and authorisation in relation to for instance financial services as for governmental services.
- Connecting the national digital identity with corresponding identities for the taxpayer in other countries simplifies exchange of taxpayer information between the tax administrations, reducing cost of compliance verification, while the taxpayer benefits from reduced operational and compliance cost.

Taxpayer identity solutions: Key considerations

Before considering the development of a digital identity solution, the administration should first check if there are *existing solutions* which can or must be reused. Reusing an existing system, in addition to the advantage of already being known to taxpayers, may reduce the overall cost of implementation. However,

²⁴ Sometimes referred to as Single-sign-on.

an existing external identity solution is likely to use a different digital taxpayer identifier than the tax-internal systems, and this may drive up the complexity and cost of introducing it.

If creating a new solution, the administration should consider the *initial and long-term scope* of the solution: Is it intended to be used only by the administration, across government or across society? If the tax administration is the pioneer in the field of digital identity solutions in the jurisdiction, it may work well to start with a tax-only solution, while maintaining a close and active dialogue with the other stakeholders for the longer-term governmental or societal solution and adhering wherever relevant and possible to international digital identity standards. However, there often is a government entity with more obvious responsibility for national identity information, like a people's registry; in this case the digital identity project may be executed from that entity, with the tax administration as an active partner in order to ensure that the solution fits tax purposes.

For jurisdictions where legislation allows for intermediaries, the administration should ensure that a proper system is in place for mandating an intermediary to make tax-related changes on behalf of a taxpayer. This will mitigate the risk of intermediaries using the client's digital identity credentials to log in, making it impossible for the tax system to distinguish between intermediary operations and taxpayer operations. Without a mandating system, the risk of tax fraud increases. For instance, a rogue intermediary would be able to cheat the taxpayer by entering incorrect data, for which the taxpayer will be legally responsible. The intermediary could also, based on extensive understanding of the tax system, exploit access to a large number of taxpayer accounts to perform numerous minor cases of tax fraud, where each of the cases might be too small to be detected by the administration.

If relevant, the administration, in collaboration with governmental and possibly private partners, should *utilise existing digital identity frameworks or standards*. There are already several frameworks available that may serve as inspiration or guidance depending on location and local conditions:

- In 2014, the EU published rules on electronic identification and trust services for electronic transactions in the internal market (eIDAS). The rules are currently under review, and an updated version is expected in 2021 (European Parliament, 2021^[24]).
- The National Institute of Standards and Technology in the USA have published Digital identity guidelines for use by federal agencies that implement digital identity services (NIST, 2020^[25]).
- A group of national and international capacity building organisations have launched the Modular Open Source Identity Platform (MOSIP) which can be used to build national digital identity solutions.²⁵ The initiative is further described in Box 5.2.
- One of the action groups in the OECD FTA project Tax Administration 3.0 is currently seeking to develop guidance for implementation of digital identity systems and exploring which elements will be necessary to ensure interoperability of such systems, including in the cross-border context. For more information, see <https://www.oecd.org/tax/forum-on-tax-administration/> or contact the FTA Secretariat.
- See also (World Bank Group, 2017^[26]) for a discussion on emerging technical standards in this area.

²⁵ For more information see <https://www.mosip.io/>

Box 5.2. The Modular Open Source Identity Platform (MOSIP) – a digital public good

- The value proposition of MOSIP can be described in at least three ways:
 - Flexibility and ownership: Countries are increasingly demanding open source software alternatives for government systems. This is driven by better capacity, a desire for greater flexibility and national ownership over a sensitive infrastructure, negative experiences with vendor lock-in, and interest in developing local ICT industries.
 - Cutting features available by default: MOSIP brings to bear functionalities, lessons and best practices from other countries, especially India, making them available by default rather than for a premium cost.
 - Greater transparency: MOSIP has contributed to addressing the knowledge asymmetry that exists between governments and vendors. By making the source code and documentation freely available, governments can see ‘what is under the hood’ and even if they do not adopt MOSIP, they can benefit greatly from studying how an ID system could be designed and developed.
- Several countries are deploying MOSIP, including with support from the World Bank’s ID4D Initiative, with the Philippines and Morocco being the countries furthest advanced in their national implementation process, and several additional countries in various stages of piloting and due diligence.
- Having been built in accordance with best practice Principles on Identification for Sustainable Development, and as the only existing open source platform for foundational identity, the Modular Open Source Identity Platform (MOSIP) provides a cost-effective alternative for accelerating the deployment of this key building block and enabler of public and private services.
- The platform is managed by the International Institute of Information Technology, Bangalore (IIIT-B), with core funding from the Bill & Melinda Gates Foundation, the Norwegian Agency for Development Cooperation (Norad), Sir Ratan Tata Trust and the Omidyar Network.
- The Digital Public Goods Alliance, which implements one of the key parts of the UN Secretary-General’s Roadmap for Digital Cooperation, has screened MOSIP as a digital public good and also recommended it for consideration by countries as a digital public infrastructure.

Source: E-mail from the Norwegian Agency for Development Cooperation, June 2021.

Case studies for taxpayer registry and identity solutions

Georgia: Employee registry

Background

Georgian State Agencies lacked complete information on the number of employees in Georgia. Although Georgian tax legislation required employers to provide information relating to the withholding taxes, this information only included data related to the source of payment and was frequently incomplete. There was no information on the number of employees required, and no sanctions for employers concealing employees.

According to analysis conducted by the Analytical Department of the Revenue Service (RS), approximately 33% of employers did not fully declare their employees' income. Whilst there may have been some legitimate errors, there were also most likely intentional attempts to avoid tax liabilities.

The lack of accurate information on employees also hampered the work of other state agencies relying on data from the Revenue Service (RS) to provide their services. For example, the amount of financial assistance provided under current legislation (including the Targeted State Programme for Harm Reduction related to the COVID-19 pandemic) was determined by the beneficiary's status and level of income. Incomplete information opened the opportunity for some not receiving their full entitlement and for fraud.

The issue also had consequences for employee pension contributions to the State pension agency. Employers who concealed employee information from the RS in order to avoid taxes did not automatically make mandatory pension contributions for each employee at the State Pension Agency, as this transaction was also completed via the Taxpayer's Personal website at the Revenue Service. This meant that employees whose employers failed to provide information to the RS were automatically left without accumulating retirement savings.

To address these issues, the RS Analytical Department began work on the Employees' Registry Programme in May 2020, aiming to increase the efficiency of various government agencies' work by creating a unified comprehensive database of employees in the country, while ensuring that the new regulations did not increase the tax compliance burden for taxpayers.

Programme implementation

For the programme planning and implementation purposes, a dedicated working group including representatives from relevant departments was formed within the Revenue Service. By the end of 2020, special software, as well as risk modules and an e-programme for task distribution, were developed in order to implement the Employee Registry Programme. Furthermore, a procedure for maintaining an Employee Registry was approved, and RS personnel involved in the Employee Registry management process received training.

External stakeholders were also involved in the process early on in the programme's development. To ensure a smooth launch of the programme, the RS organised a series of meetings and seminars with taxpayers, various business associations, and media representatives. As a result of the meetings, private sector recommendations for improvement and issues that would impede compliance from a business standpoint were taken into consideration by the programme development process. Another positive outcome of the dialogue with the private sector was that businesses that would be impacted by the programme were well informed and prepared for the upcoming regulations.

By 31 December 2020, all relevant legislation required for programme implementation were approved. This means that, beginning on 1 February 2021, all employers are now required to provide information on employees prior to the entry into force of a labour agreement.

The short-term approval of the draft law on the Employee Registry was facilitated by the fact that the problems discussed above were exacerbated by the COVID-19 crisis, and, as previously stated, a lack of complete information on employees harmed both the state budget and the people in need on a larger scale.

What exactly does the Employee Registry Programme entail?

According to the Employee Registry Programme, employers are obliged to import information about the employees into the dedicated e-registry before entering into a labour agreement with the employee. For that purpose, a new section under the title “Employee Registry” has been added to the taxpayer’s personal page on the Revenue service’s web-portal. The new section consists of two tabs: “Employee Registry” and “Employee History”.

- In the first tab, the following information of the employee is required: ID number, name, sex, nationality, date of birth, phone number, salary rate and status (active, suspended, terminated).
- In the second tab, information on those with status “suspended” and “terminated” is collected. The status “suspended” is granted in case when the employee cannot implement duties imposed by a labour agreement temporarily (because of strikes, lockouts, paid vacation etc.). To ensure accuracy of the registry, there are built-in validation controls mechanisms on these fields. A status “terminated” is granted to only those employees who do not implement duties imposed by labour agreement for more than 90 calendar days. (This particular rule was recommended by taxpayers during the discussions at the programme development stage).

In addition to random spot checks, the accuracy of the registry is maintained by registry information being processed through a risk module. When risk of error is detected, information is forwarded to the tax monitoring department officer for manual processing of the data. The officer will first try to resolve the issue by contacting the employer, and if this fails, the officer will then go on a site visit to check the accuracy of the provided information.

A penalty can now also be imposed on the employer if employees are discovered to be missing from the list provided by the employer via the Employees’ Registry. If the issue has not been resolved within 24 hours, another penalty can be imposed.

Programme effectiveness assessment

The programme’s effectiveness has been assessed in three aspects: Registrations, risk module efficiency and fiscal effect.

- **Registrations.** According to the withholding tax returns, 681,168 persons received salaries for the reporting period of April 2021. Meanwhile, 81 928 employers provided information through the Employee Registry, where the number of persons employed by them amounted to 1 110 000. In April, the number of employers providing information via the Employee Registry increased by 3 500 comparing to March, while the number of employees increased by 35 000. The vast majority of the employers voluntarily joined the programme at the very first stage of its execution, which indicates that programme introduction events for employers were successful.
- **Risk module efficiency.** 97% of the employers contacted voluntarily corrected errors in their Employee registry, while only 3% refused to cooperate with the RS. In the case of the 3% of non-compliant employers, the RS used physical examination and penalty imposition. The risk module is effective, and the majority of employers voluntarily correct or add the information when requested to do so, lowering administrative costs.
- **Fiscal effect.** As for the fiscal effect of the programme, the RS has analysed the impact of the Employee Registry programme on tax revenue collection, with particular focus on the effect of communication with employers after they were selected through the risk-based method. As the result of communication, for the period from April to June 2021, employers have additionally registered 6 935 609 GEL of earnings, contributing 1 335 198 GEL income tax.

Lessons learned

When implementing programmes similar to the Employee Registry, it is critical to ensure open lines of communication with all stakeholders, particularly during the initial stages of programme implementation. Communication aids in considering issues of particular importance to specific industries and making appropriate changes to legislative provisions as needed.

Source: E-mail from Georgia Revenue Service, October 2021.

Thailand: National Digital Identity Platform

The National Digital Identity Platform (NDID) is intended to provide a flexible and highly secure method of self-identification for any Thai citizen, and will be designed to leverage any reliable identity the user currently holds. Examples of reliable identity could be Citizen Id, Bank Account ID, Passport Number, Tax ID and Biometric Data.

By adopting NDID, the Thailand Revenue Department (TRD) expects to deliver a trustworthy and transparent solution which gives new users an adequate level of confidence in the security. In addition, NDID will provide users with safe and secure ways to manage and protect their ID online, including on their mobile devices. NDID can also improve the convenience and effectiveness of both government and private sector services.

In collaboration with the Bank of Thailand, the commercial banks and the National Digital ID Company Limited, TRD is developing a digital identification system via the NDID Platform to facilitate and safeguard online transactions and prevent fraud, starting with a pilot project on .Personal Income Tax e-filing.

Quite a number of taxpayers have logged in via the NDID Platform since 18th March 2021, but the pilot project has also uncovered some challenges, such as a lack of and awareness of the opportunities offered by digital ID and the NDID Platform. Following up the results of the pilot, TRD and partner banks continue to encourage enhanced user adoption of the service. Furthermore, the banks will allow for self-identification via bank applications for access to the TRD's website, enabling user access to further services in the future.

Users of NDID first go through *Enrolment and identity proofing* (getting a digital ID) and then use this for *Authentication and data access authorisation* (using the digital ID).

Benefits of TRD Digital ID Authentication via the NDID Platform include:

- Improved authentication and verification standard
- High levels of accuracy
- Enhanced security
- Lower operational costs
- A better customer experience
- Integrated government agency services

Note: For more information, please contact email.ita@rd.go.th.

Source: E-mail from Thailand Revenue Department, September 2021.

Integrated tax systems

A complete and integrated system for supporting the tax administration's responsibilities normally constitutes most of the taxation-related ICT solutions in an administration. The word complete indicates that it covers all aspects of ICT-backing for core tax functions, while the word integrated underlines how all components of the system interact and contribute to the fulfilling its purpose, for instance by using the same taxpayer identifiers throughout the system. In this context the digital part of the system is given; most likely no tax administration any longer keeps track of all of its taxpayers and their obligations on paper. However, some administrations may not yet have reached the stage where the entire system for supporting its responsibilities is integrated with all areas of core tax ICT-support are covered, and may therefore be considering such a digitalisation investment.

It is increasingly common for tax administrations to employ a single core tax system that covers all functions of integrated tax systems as described below. However, many administrations also have built or bought separate components and integrated them; this is more likely in large and complex administrations with considerable in-house ICT experience and the need to continue using legacy systems.

A complete and integrated system supporting the tax administration's responsibilities is commonly expected to cover at least the following three areas of functionality:

- The **core tax system** constitutes the largest part of the integrated system, and offers functionality for all tax functions, from registration via assessment, verification and collection to dispute and compliance verification, including case handling for all relevant areas. It is typically either built according to the administration's specific requirements, assembled from a combination of tailor-built and prebuilt components, bought as commercial-off-the-shelf (COTS) software, or rented via a Software-as-a-Service (SaaS) contract, one of the services often referred to as Cloud services. SaaS for core tax administration systems is not yet very common, but is likely to increase in popularity over the next decade.
- The **comprehensive view of the taxpayer** may come as a component or feature of the core tax system, but it can also be built separately. It allows the tax official to see all information available to the administration about a taxpayer and its network, including for instance tax returns, payments and cases handled, in a single easy-to-use interface. Thus, it has many similarities with the user interface of Customer Relation Management (CRM) systems used in the commercial sector. Common separately built solutions include
 - building the comprehensive taxpayer view entirely in the end-user interface, with data residing in the separate ICT systems; and
 - using a data warehouse or other information platform to collect and integrate the data from all the separate ICT systems, and present the data to the users using a Business Intelligence-based tool.
- The **interface components** used for exchanging data with external public and private partners are usually offered as part of prebuilt and rented core tax systems, but can also be added on. The currently most common method for building interface components is probably Application Programming Interfaces (APIs).²⁶

Core tax systems: Benefits and key considerations

A **core tax system** that supports best practice tax processes allows the administration better control over its processes, while having all data connected to and relating to the same taxpayer registry information. This is likely to increase data quality and data security due to the reduced number of internal system

²⁶ For more information on APIs, see Annex D.

integration solutions. Consequently, such systems when functioning as intended are likely to ensure greater compliance control and thus increased revenue, though they would need to be complemented with a comprehensive taxpayer view to fully exploit the benefits of having all internal taxation data interconnected. Integrated core tax systems may also allow for greater automation of tasks, since all the information needed for automation is available in the same system; this is likely to increase the quality of work, improve taxpayer satisfaction and reduce administration cost.

Considering the alternative to an integrated core tax system further illustrates its benefits: If the data concerning taxpayers resides in separate ICT systems that require manual synchronisation, for instance by printing a summary of tax due from the income tax system and punching the number into the collections system, the probability of deliberate and unintended mistakes increases drastically, and coordinating actions related to a single taxpayer becomes quite difficult.

In preparation for creating or replacing the core tax system, administrations will find a summary of characteristics of tailor-built software, COTS software, SaaS solutions and combinations of these discussed in Chapter 4, while Annex D goes into more details on the benefits and drawbacks of the solution styles and issues related to developing or procuring such ICT-solutions. For administrations choosing the COTS-alternative, further guidance can be found in an OECD-report on introducing a COTS-system for core tax functionality based on experience from the Finnish Tax Administration. (OECD, 2019^[27])

Comprehensive taxpayer view: Benefits and key considerations

While a comprehensive taxpayer view is not a prerequisite for performing core tax functions, it carries significant benefits related to high quality tax work, since it allows the tax administration staff to see all relevant and available information when making decisions regarding a taxpayer. This can help employees take a taxpayer-centric point of view, increasing their overall understanding of the taxpayer's situation and allowing for better decisions.

Conversely, if the administration does not supply its staff with a comprehensive taxpayer view, the work related to different tax types or tax functions is more likely to be disjointed, with for example one administration unit paying a refund to a taxpayer while another unit is trying to recover debt from the same taxpayer, or that a taxpayer is considered and treated as compliant by one unit while another unit has information about non-compliance.

For administrations that decide to invest in a comprehensive taxpayer view as part of their digitalisation journey, buying or renting a tax system with a built-in comprehensive taxpayer view may be the quickest path to success.²⁷ However, this is not an option for all administrations, due to local conditions and decisions. Those who instead intend to build the solution in-house or with hired help and consider the two alternatives mentioned above should keep in mind that there are benefits and drawbacks associated with each alternative. For instance:

- Building the comprehensive taxpayer view in an end-user interface with data residing in separate ICT systems is usually considerably less complex than building an information platform, but the option may not be available to all administrations: It requires that all the necessary source systems have the capacity to deliver data to the interface. Since many transaction-oriented tax systems are not built for extensive searching, they may give unacceptable response times if the searches overload the system, interfering with the daily operation of the tax administration. Administrations considering this option should first have qualified ICT staff assess the capability of all relevant source systems to ensure that the option is viable.

²⁷ For further discussion on benefits, drawbacks and considerations related to common options for tax systems, including buying or renting, see Chapter 4 and Annex D.

- Creating a data warehouse or other information platform on which the comprehensive taxpayer view will be based is usually a massive undertaking, but it also comes with a range of new opportunities and potential benefits, many of which are described in the section on Analytics. Furthermore, a comprehensive taxpayer view based on an information platform will be able to integrate taxpayer-related data from external sources like other government systems, private sector systems or social media. Enhancing the view of the taxpayer for staff in this manner will allow them to make more informed decisions.

Interface components: Benefits and key considerations

A tax administration is intricately connected to the financial life of society, nationally and increasingly also internationally. Secure and efficient interfaces between internal and external ICT systems can therefore be considered a prerequisite for a digitalised tax administration; it is virtually impossible to work efficiently as a digitalised tax administration without exchanging significant amounts of data with external systems.

Given their importance, it follows naturally that interface components also offer a range of benefits for digitalised tax administrations. They can for instance facilitate exchanging data with third parties for compliance verification and prefilling, using cross-border financial transaction data for fraud detection, and using data from other public entities in tax processes to increase quality and ease the taxpayer burden.

The topic of interfaces is covered in more detail in Annex D, and the OECD has published a report on implementing Application Programming Interfaces in government, which offers further guidance in this area. (OECD, 2019^[28])

Case studies for integrated tax systems

Indonesia: Core Tax Administration System Reform

The Directorate General of Tax (DGT) in Indonesia recognised that to support future development in the administration and its core business processes, a new core tax system was needed. This would also consolidate data from payment, reporting, billing, and other activities into a comprehensive accounting system (known as the taxpayer account), and provide an integrated, systematic, and automated risk-based approach to perform functions (including law enforcement functions such as auditing and criminal investigation). Recognising the scale of the challenge, DGT decided to use a commercial off-the-shelf (COTS) application system to ensure that best practice was being implemented, and this also reduced the failure risk in the application development and expedited the implementation process.

Acknowledging the complexity of this task, DGT went through a careful planning process that covered strategies for project management, procurement, and implementation stages, which was supported by a dedicated corporate governance structure. DGT also identified skills gaps and brought in specialists to support specific areas of work. For example they recognised their limited experience in international procurement and therefore hired specialist staff to support this.

Through this combination of strategic planning and specialist staff, the project team have been able to overcome the many challenges, and also provide clear frameworks to support the many decisions that the leadership have had to take in this project. The project is currently approaching the end of the design phase.



Israel: Zero VAT on hotel accommodation services

Tourists pay zero rate VAT on various services consumed in Israel, such as hotel accommodation services, car rental and more.

The Israeli Tax Authority (ITA) has access to entry and exit data of residents and foreigners through the border controls database, and the ITA allows access to the tax authority's API service for the purpose of checking the accuracy of tourists' passport numbers. For example, hotels can enter the details of the transaction (including passport number, country of origin), and receive an indication of whether the tourist is entitled to a zero rate VAT.

As the system verifies that it is indeed a tourist entitled to zero rate VAT, it prevents forgeries and mistakes, and reduces the administrative burden on the hotel. It also reduces hotels' exposure to audit and charges due to guests not being eligible to zero rate VAT.

Source: (OECD, 2021^[20])

Kenya: System integration with public and private partners

The Kenya Revenue Authority (KRA) has been exploring the adoption of APIs in an effort to enhance tax compliance by extending tax services to taxpayers through service providers such as software developers, technology companies, banks and government agencies. This, coupled with the need to integrate with third party data sources, has necessitated KRA to look into utilising APIs and Electronic Service Buses (ESBs) for the management of multiple integrations.

KRA has already implemented web services and other forms of APIs to enable system integration with 43 banks and partner government agencies including [Central Bank of Kenya](#), [Kenya Trade Network Agency \(KenTrade\)](#), [Kenya Ports Authority \(KPA\)](#) and the [National Treasury](#). However, integration with other players in the private sector is an initiative KRA is yet to realise.

Efforts are underway to implement APIs that extend tax services to taxpayers. This will be achieved through creation of interfaces that will integrate with taxpayers' internal systems, allowing taxpayers to perform their tax operations with ease. KRA's 4th ICT Strategy (2021- 2024) provides for implementation of APIs to achieve integration benefits of standardisation in a secure and robust environment with internal and external systems in order to facilitate tax filing and payments. This is intended to reduce the cost of compliance and enhance data-driven decision making in the organisation.

Source: E-mail from Kenya Revenue Authority, October 2021.

Russia: Tax Monitoring

Since 2016, the Federal Tax Service (FTS) has enacted a new tax compliance regime called "Tax Monitoring". Tax Monitoring is not mandatory; it is an optional system that taxpayers can use, and which runs in parallel to the existing tax system.

Robust and secure authentication are the core principles of Tax Monitoring. These are required to grant the tax authority remote access to the taxpayer's accounting and tax reporting system(s) through APIs. Direct access to the taxpayer ecosystems based on a risk-based approach, embedded at a transaction-level, provides for ongoing due diligence and monitoring to determine whether transactions may contain emerging risks or early warning signs.

Those taxpayers who volunteered to participate in a pilot testing of the system were the most digitally advanced largest taxpayers with the highest level of process automation. This allowed them to have more time to adapt their systems, staff and business processes prior to the new tax compliance regime becoming mandatory.

The Tax Monitoring system makes it possible to embed tax controls within taxpayers' natural ecosystems. This, in turn, facilitates compliance by design creating a seamless customer experience carried out due on time in an effective and efficient manner.

Source: (OECD, 2021^[20]).

Comprehensive taxpayer communication solutions

Effective communication between taxpayers and the tax administration is at the heart of an efficient tax system. Historically, tax administrations have employed a variety of communication channels like counter services, printed material and call centres to deliver this.

The growth of digital channels offers new ways for taxpayers and tax administrations to communicate which can offer both increased convenience for the taxpayer and greater efficiency for the tax administration. Frequently, digital communication channels can also offer opportunities for reduced costs, and administrations investing in digital taxpayer communication solutions usually have a channel shift strategy in place which aims to move taxpayer communication from labour intensive channels like counter service and phone to cheaper services like self-service portals, mobile apps and chat functions.

It is important though that a comprehensive taxpayer communication solution offers the right range of communication channels between taxpayer and administration, adapted to the needs of both. Whilst digitalisation does offer opportunities move to more efficient channels, this should be done carefully, as local circumstances may dictate that a combination of traditional and digital channels may be needed.

Taxpayer communication solutions: Benefits and key considerations

Digital taxpayer communication solutions can be expected to reduce the total cost of communication and, when combined with digital services, allow for more upstream (i.e. earlier in the taxation process) and proactive rather than reactive communication, which is likely to increase both taxpayer satisfaction and compliance. Furthermore, allocating staff to areas with greater impact on the administration mandate is likely to increase job satisfaction as well as administration efficiency.

The cost savings can be significant. A study by the Australian Tax Authority showed that one AUD spent on digital service provision could replace service by phone which would cost 16 AUD, service by post which would cost 32 AUD, or service in person which would cost 42 AUD. (ICAEW, 2019^[29]) The actual savings will of course vary, depending on local conditions.

Although comprehensive solutions adapted to local conditions give the most far reaching benefits, even separately offered digital communication solutions can offer significant value, and some of them can be introduced at a fairly low cost. For instance:

- *Online tax administration information* available without login, when well-structured and written in language adapted for the target group, can increase compliance among taxpayers that want to comply but struggle with understanding the rules. It can also reduce the number of incoming questions to the administration, possibly allowing for savings on counter or call centre service. Overall this can be expected to contribute significantly to solving the need for information and understanding at a reasonable expense.
- *Social media interaction* with taxpayers, while not requiring costly ICT system implementation, allows the administration to reach new groups of taxpayers and may improve the image of the administration in the eyes of the younger generations while also unloading traffic from counter and call centre services.
- *Taxpayer portals and mobile apps based on login with digital identity*²⁸ increase the opportunity for taxpayer self-service. Not only does this reduce the workload for the tax administration, it also increases taxpayer satisfaction due to the 24/7 availability of the services offered in the portal or app. Although such solutions are more expensive than the ones above, they may offer significant added benefits in the longer term. For instance, the portal can be expanded to offer opportunities

²⁸ Digital identity is covered earlier in this chapter.

for reporting and payment, becoming the key component of a comprehensive taxpayer communication and service solution.

- *Chatbots* are increasingly used for handling simpler incoming taxpayer queries, allowing the frontline staff to concentrate on the more interesting complex questions. Given the significant growth in use of such solutions in the private market, the options for buying prebuilt chatbot solutions are expanding, thus making the solutions less costly.
- *Digital messaging services* such as email and SMS can also be used to deliver messages to large numbers of taxpayer groups in a cost effective way. These can also be targeted and personalised more effectively than other forms of communication.

The benefits related to taxpayer satisfaction and compliance can be expected to multiply when the entire set of communication solutions is adapted to the relevant taxpayer groups. It is therefore essential that the administration alerts taxpayers to the new services and promotes them. In turn this will improve the taxpayer's perceptions of the administration, who will see a service-oriented administration which aims to make compliance easier.

It is important though that the administration *makes a careful analysis of the taxpayers* to ensure that communication is adapted to need, and existing analogue services are not discarded until rendered obsolete. Offerings like counter service and call centre may complement digital channels, and taxpayers should be encouraged to use the channels deemed most efficient and giving the best quality service according to their situation. Those situations can cover:

- **Information:** The taxpayer receives information from the administration, either at the initiative of the administration, or at their own initiative.
- **Interaction:** The taxpayer or the tax administration initiates a session of interaction with the other party. The other party responds, commonly but not always via the same channel.
- **Transaction:** This third category of communication is normally categorised as taxpayer service and therefore covered in more detail in the next section; it is the form of interaction that generates transactions, for instance registration, tax return filing, paying taxes and settling disputes.

Of course, *communication often flows between the categories*. For instance: A taxpayer may receive a notice of tax payment, check the administration's web site to understand the basis for the notice, initiate a login-based chat with the administration to complain about the notice perceived as incorrect, and be informed of the correct formal procedure for complaint, which initiates a set of transactions in a dispute.

This flow between channels is important in a digitalisation context. Tax administrations that maintain a comprehensive history of taxpayer communication across all channels are much more likely to deliver taxpayer services of high quality. This is because any previous communication can be taken into account, which is likely to lead to better compliance because the taxpayer feels that they matter to the administration and are being taken seriously. Consequently, the composition of an appropriate set of communication channels should be paired with plans to ensure that all channels feed logs of taxpayer communication, and that the information from the logs is organised by taxpayer and easily accessible for frontline staff.

With such a wide range of options in digital channels, which may be seen as low cost, it is important that the tax administration *only implements the necessary digital channels*. Having too many may lead to confusion and costly duplication of information. The administration should carefully analyse which digital channels are needed and how they can replace or complement analogue channels, in order to get the right set of channels according to taxpayer segments.

Particular care should be seen in introducing *social media channels* based on commercial social media platforms. It is important that taxpayers don't reveal confidential information through the channels, and the administration is advised to continuously notify taxpayers of the limitations and risks of communicating

through channels provided by a third party. Tax administrations should also have clear anti-fraud measures, monitoring for fake tax administration accounts.

Tax administrations utilise many different variations of *chatbots*. The simplest variants are based on a pool of questions and answers which can be manually produced and continuously enhanced by experienced tax officials, while the advanced versions will base the dialogue on artificial intelligence. As with other electronic communication between taxpayer and administration, the level of authentication preceding the dialogue will have profound impact on how the chatbot can be used: only if the chatbot is available after a login procedure where the taxpayer has been duly identified, can the dialogue include sensitive information. Box 5.3. offers some advice for creating a chatbot based on artificial intelligence.

Box 5.3. Sweden: Success factors for creating a chatbot based on artificial intelligence

The Swedish Tax Agency determined that there was potential for improved taxpayer service and reduced demand for expensive call centre service through the development of a chatbot based on artificial intelligence. The presentation linked below shares more of the story behind Skatti, the digital co-worker in the customer service department of STA. Conclusions from the presentation include the following recommendations:

- Use contact centre agents as AI trainers
- Create social small talk
- Start with one area of expertise
- Start testing within your agency (intranet, if possible)
- Guide customers in areas where the chatbot still isn't trained

Note: For more information, see presentation or contact international.relations@skatteverket.se.

Source: Presentation by Ms. Helene de Faire from the Swedish Tax Agency in 2019, updated in August 2021, available here: <https://oecd.org/tax/forum-on-tax-administration/publications-and-products/Sweden-chatbot-using-AI-2019.pdf>.

Finally, it is important to remember that changes in the field of taxpayer communication can have profound impact on *staff responsibilities*. Some staff may even have to assist in reducing or removing the need for their current job: Physical mail service, call centre and counter staff are often expected to encourage taxpayers to use digital channels, telling the taxpayer “you can also do this online,” when the consequence of the taxpayer following their advice may be that part of their job is removed. Tax administration management may choose to transition staff to the new roles through a training and reallocation programme. This can have significant benefits on staff retention as it allows experienced staff to focus on more specialist tasks, when the simpler tasks are replaced by digital services.

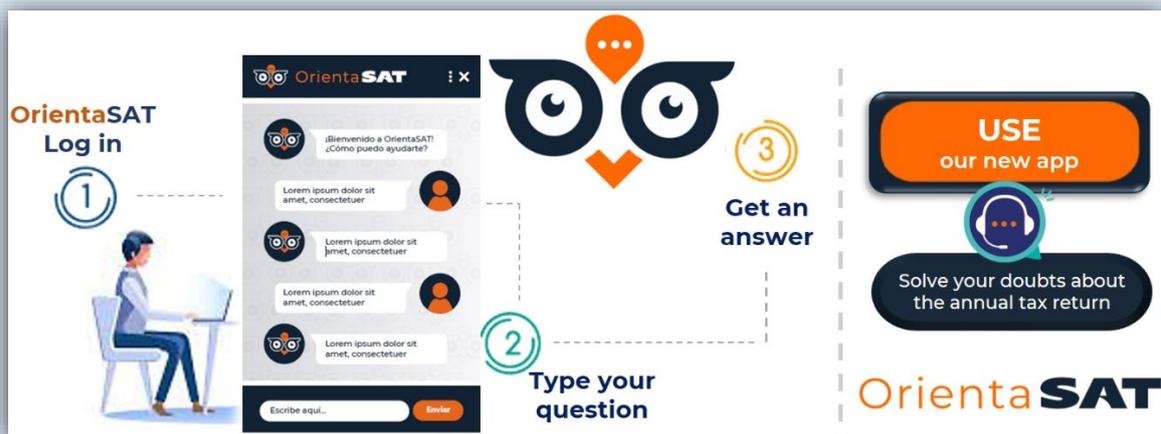
Case studies for taxpayer communication solutions

Mexico: OrientaSAT chatbot for guiding taxpayers

The Mexico Tax Administration Service (SAT, in Spanish) has implemented the chatbot called OrientaSAT. The chatbot was the initial point of contact for guidance on the 2020 Annual Return of Individuals, filed in April and May 2021. The service was launched using a knowledge base consisting of 1,149 standard answers and 17,776 variants of questions. This allowed taxpayers to;

- ask their questions 24 hours a day, 7 days a week, 365 days a year and;
- have access through a computer, tablet or smartphone;
- get assistance from their homes for safety and comfort; and
- benefit from reduced response times.

During the filing period, OrientaSAT recorded 263,000 guidance and information visits, which represented 37.6% of the total number of visits provided to taxpayers through telephone, chat and OrientaSAT channels. 51% of the taxpayers who answered the chatbot satisfaction survey said that the quality of the information and service provided by OrientaSAT was good or very good.



Note: For more information about OrientaSAT and other innovative taxpayer solutions offered by SAT, contact general.serviciosalcontribuyente@sat.gob.mx or see <https://oecd.org/tax/forum-on-tax-administration/publications-and-products/Mexico-Orientasat-and-SAT-ID.pdf>.

Source: E-mail from the Mexico Tax Administration Service, October 2021.

Malaysia: Online interface for taxpayers

MyTax, one of the digital transformation initiatives of the Inland Revenue Board of Malaysia (IRBM), is a web and App interface developed by the IRBM that supports interactive two-way communication between the tax administration and taxpayers and allows taxpayers to manage their tax transactions online after single sign-on. MyTax offers a responsive view, smart notification and virtual assistance for taxpayers to manage their tax obligations easily and securely. Currently, the MyTax App covers tax

profile information, tax payment status, tax enquiries, secure digital mailbox, e-notices, customer surveys and the knowledge centre platform. The web interface also covers digital audit, auto refund, auto instalment and real-time information.

Source: E-mail from the Inland Revenue Board of Malaysia, September 2021.

China: Guiding taxpayers to “non-contact” channels

As part of their response to COVID-19, the Chinese State Taxation Administration (STA) actively expanded the “non-contact” taxpayer service channels so that 214 tax-related matters could be resolved online, and guided taxpayers to use mobile apps, official accounts on social media, self-service machines and other channels to handle tax-related matters. As a result, tens of millions of legal entities and hundreds of millions of individuals conducted tax-related businesses online during the pandemic.

Further, using emerging technologies such as artificial intelligence, cloud computing and deep learning, STA can accurately respond to taxpayer questions, deliver policies on tax and fee reduction, and provide intelligent consulting services for taxpayers. During the COVID-19 pandemic, STA applied this learning to provide 24/7 self-service for taxpayers, which ensured taxpayers had a range of tailored services at their fingertips to help them understand tax policies. This new self-service channel now accounts for more than 25% of consultations, meaning it has become an important channel for serving and helping taxpayers.

Source: (OECD, 2021^[20])

Georgia: Redesign of administration’s website

Totally redesigned and equipped with additional functionality, the new website of Georgia Revenue Service has been tailored to meet the requirements of taxpayers and other users of the website. As the result of the redesign:

- The visual design of the website has been entirely changed and adjusted to modern needs.
- The website content has been updated and reorganised into 3 clear sections, general information, taxpayers – natural persons, and taxpayers – legal persons.
- Around 200 definitions on tax and customs matters have been translated into English.
- Internal guidance on managing the website has been enhanced.
- A user feedback page has been added.
- A new communication channel has been added: the “Revenue Service Chat”.

Since the changes, 0.01% of all users left their feedback on the website, with 54% of all feedback being positive, and the vast majority of user recommendations with regards to the website have been incorporated.

Source: (OECD, 2021^[20])

Peru: Virtual assistant – SOFIA

In early 2018, the Peruvian tax administration (SUNAT) decided to introduce a chatbot, SOFIA, to answer a range of the most straightforward and frequent taxpayer queries, with the aim of reducing call volumes.

SUNAT created a multi-disciplinary team which was responsible for both the technical build of the chatbot, and designing the content. The service launched with two topics: the tax receipt lottery and income tax refunds, with other topics related to employment income added during 2019. During 2020, the tool continued to evolve, and improved both the accuracy and speed of response. Now it handles queries related to taxes on capital and income and some tax procedures, and this year SOFIA has responded to 248 125 messages with 97% effectiveness. SUNAT expects to improve SOFIA further and to incorporate new topics related to customs enquiries.

Source: (OECD, 2021^[20]).

Taxpayer service solutions

Digitalisation offers significant potential for improved taxpayer services by moving the services from analogue to digital solutions. This section focuses on three of the most common services: electronic filing, digital payments and prefilling. As all three services are fairly common, there is ample opportunity to seek advice from peer administrations. The ISORA database also can be used to locate relevant administrations in this regard. (ADB, CIAT, IMF, IOTA, OECD, 2021^[22])

Electronic filing solutions allow taxpayers to complete their filing obligations through electronic interaction with the tax administration, replacing filing on paper and simplifying the process. The nature of filing varies between administrations and according to taxpayer group and tax type. For instance, while a personal taxpayer may file the Personal Income Tax return by completing a form in an online portal, a business may file the Corporate Income Tax return from a financial software package which uses an Application Programming Interface (API), and their VAT return may be prefilled by the tax administration based on online invoicing. According to ISORA 2020, the median percentages of electronic filing for Corporate Income Tax, Personal Income Tax and Value-added tax for 2019 were 71%, 64% and 74% respectively among the 154 participants. (ADB, CIAT, IMF, IOTA, OECD, 2021^[22]), showing that electronic filing is an increasingly common choice across the world.

With a **digital payment** solution, the taxpayer fulfils their payment obligations online instead of paying at a tax office, and the tax administration receives the payment without any staff action. Such solutions are also growing in popularity; For the 156 participants in ISORA 2020, 57% of payments were received electronically by number of payments in 2019. (ADB, CIAT, IMF, IOTA, OECD, 2021^[22]) 25% received 90% or more of the payments electronically.

When **prefilling tax returns**, the tax administration uses data from its own systems and third parties to complete as much as possible of the tax return before it is made available to the taxpayer for completion or verification. Some administrations choose to combine prefilling with deemed or tacit acceptance: If the taxpayer chooses not to respond to the prefilled tax return message from the tax administration, the lack of response is interpreted by the administration to mean that they accept the prefilled version as the final version.

The opportunity for seeking peer advice is expanding also for prefilling. For instance, among the 156 participants in ISORA 2020 reporting on personal income tax (PIT) returns for fiscal year 2019, 20 used fully prefilled tax return with deemed acceptance, 17 required confirmation on the fully prefilled return, and 37 partially prefilled the tax return. (ADB, CIAT, IMF, IOTA, OECD, 2021^[22]) In other words, almost half of the participants partially or fully prefilled the tax return for PIT taxpayers.

Electronic filing: Benefits and key considerations

Introducing electronic filing of taxation information gives advantages to the taxpayers and the administration: Taxpayers will save time and personnel resources used for compliance, and the administration will receive more accurate information which is likely to be more on time, for tax assessment and compliance evaluation. In combination, these advantages are likely to give increased taxpayer satisfaction, improved compliance and higher revenue. Electronic filing also simplifies the introduction of prefilling of tax returns, which is another compliance-improving and taxpayer-friendly digitalisation solution, and some of the electronic filing variations allow the administration to employ nudging in order to improve compliance.

A tax administration considering electronic filing is advised to start by determining the *scope and style* of filing, as a framework for the work that is to follow. The scope is usually limited to one tax type at a time, sometimes also further limited to a group of taxpayers filing for that type, in order to limit the complexity of the project. Nevertheless, the complete end result should be taken into account from the start, to ensure that design decisions allow for expanding the solution in the future.

The common styles of electronic filing have different benefits and drawbacks:

1. The taxpayer manually uploads a file on the predefined format to the administration's system. Though less time consuming than paper filing, this solution still places a heavy compliance load on the taxpayer. For the tax administration, the remaining processing can in most cases be done automatically as long as the file contains the correct information, but any errors or omissions may generate considerable manual work for both taxpayer and administration.
2. The taxpayer fills out a form on the administration's system, typically in an encrypted session over the internet. This variation is sometimes called online filing, and is usually only used when the information required from the taxpayer is quite limited, either due to simple reporting requirements or extensive prefilling, since extensive manual reporting would place a heavy compliance load on the taxpayer and most likely generate typing errors. The solution has the advantage that the tax system can give immediate feedback to the taxpayer regarding any errors or omissions that the system can detect, allowing for higher data quality with less effort for both parties.
3. The taxpayer's financial system transfers the necessary information to the administration's system, normally in a dialogue form where any errors are immediately reported back to the taxpayer system. This is probably the preferred solution for most cases where the amount of data to be reported is large. It is likely to be more complex to introduce due to the machine-to-machine interface and the dependence on a critical mass of financial software vendors willing to add reporting functionality to their systems. However, when in place, it places minimal compliance burden on the taxpayer and allows for streamlined and efficient handling of the information by the tax systems.

Regardless of style, electronic filing requires electronic communication between systems outside the administration and core tax systems in the administration. Electronic filing solutions should therefore be *considered in relation to other electronic services*, so that even if only one service is implemented at a time, they all integrate seamlessly. For instance, the advantages of allowing taxpayers to file electronically will be lost if the information has to be printed out and re-entered manually in the tax system at the back-end. Similarly, the taxpayer would benefit less from online filing if they cannot pay online as well.

A crucial success factor when offering electronic taxpayer services is simplicity, and this in most cases implies offering a *single interface* where all tax-related tasks (and preferably other government-interaction tasks) can be performed. Administrations that offer electronic services for registration, filing and payment for a taxpayer group should offer all these in a single portal. This should be part of the plan from the beginning, so that even if the initial secure portal only offers a single function, it is designed to later include all electronic taxpayer services.

Finally, just like for all solutions based on transfer of data between external systems and internal tax systems, there must be appropriate encryption and other security mechanisms in place to safeguard the solution from unauthorised access. For more information on this topic see Annex D.

Digital payment solutions: Benefits and key considerations

Digital payment solutions are often considered essential for digitalisation, and introducing such solutions can bring significant benefits to both the tax administration and taxpayers. For instance:

The tax administration can:

- reduce its costs and improve the efficiency of collection through automated payment;
- increase the on-time payment by providing a seamless, secure and instant payment solution;
- increase revenue through reduced opportunities for corruption when cash is no longer used;
- use the data generated from the digital financial flows for analysis to improve compliance and taxpayer service; and
- contribute to the wider development of society by introducing digital payment solutions which are available to other organisations.

The taxpayer can:

- save time and cost on the payment process itself, for instance by paying online or by mobile phone instead of traveling to a payment centre;
- have greater assurance that the payment has been made to the administration without any leakage along the way;²⁹
- experience the convenience of being able to pay outside of payment centre business hours; and
- enjoy greater certainty on tax matters with instant settlement and timely tax balance updates.

The administration should consider which digital payment *solution or solutions* to offer, giving due consideration to existing alternatives and estimating the cost-benefit of relevant solutions, which will vary by jurisdiction. Common approaches include the following:

- An existing solution for payment via debit or credit card at the counter can be expanded to also allow for payment by card online.
- The administration can adapt existing solutions for payment by mobile phone to allow tax payment via this channel, or collaborate with other jurisdiction partners to introduce mobile payment solutions and ensure that tax payment is included.
- In countries with financial infrastructure that allows for electronic transfer between bank accounts, the administration can adapt its systems to allow for direct transfer to the tax administration account. There are several variations of this solution; for instance, some countries' financial systems may allow the tax administration, after approval by taxpayer, to withdraw the amount due

²⁹ A case study from the Better Than Cash Alliance in 2016 showed that shifting from cash to digital payments in cash-heavy industries like tourism in Tanzania could reduce leakage by up to 40% (Pillai, 2016_[81]).

directly from the taxpayer's account, while in other countries, the taxpayer initiates the transfer to the tax administration just like for any other debtor.

When designing or setting requirements for digital payment, the administration should also consider the principles and methodology for *matching payments* with taxpayer accounts. Depending on circumstances this may be a quite simple matter, for instance when the taxpayer is identified with a digital identity, or fairly complex, for instance when the taxpayer pays using someone else's account or mobile phone.

When planning digital payment solutions, other digitalisation deliverables like digital identity solutions and electronic filing solutions should be *co-planned*, to ensure that the different digitalisation components integrate seamlessly. The following leading example illustrates the integration between the National Digital Identity System and a range of solutions for paying taxes and other dues electronically in Singapore.

Figure 5.2. Example of Singapore's electronic and mobile payment ecosystem



Source: Inland Revenue Authority of Singapore, June 2021.

Prefiling tax returns: Benefits and key considerations

Using third-party data and data from previous tax years to prefill tax returns may deliver a range of benefits. For instance, it can:

- Reduce the taxpayer compliance burden, since the administration includes data in the tax return that otherwise the taxpayer would have to supply.
- Improve the certainty for taxpayers that correct information has been used, since the information comes from tax systems and third parties responsible for the data.
- Improve the tax administration's reputation through more personalised service for each taxpayer, faster tax return processing and faster pay-out of overpaid tax.
- Ensure higher data quality due to reduced chances of typing errors. A taxpayer is much more likely to input the wrong value in an empty field than to change a value suggested by the administration.

Administrations that seek to offer prefilling of tax returns are advised to start by selecting *initial and long term scope* for prefilling:

- Prefilling is in theory relevant for all taxes for which the taxpayer has an obligation to declare the figures used for assessment. However, which taxes are practically relevant for prefilling depends on several factors, including if high quality data is available to the tax administration electronically. This is why tax administrations often start with one tax for which to offer prefilling, and expand with other taxes based on the experience of previous solutions. For instance, Chile introduced prefilling of personal income tax returns in 2002, and followed up with introducing prefilling of VAT returns in 2017, after electronic invoicing had become mandatory in 2014. (CIAT, 2020^[6])
- The choice of prioritising tax types should also factor in the amount and quality of available data per tax type. For instance, as the example from Chile shows, if the administration uses or plans to introduce online invoicing, VAT would be an obvious candidate for prefilling.
- Another factor influencing the decision regarding where to start could be the level of compliance for each tax return obligation; the administration may have more to gain in improved compliance and increased revenue by targeting a tax that shows low tax return compliance.

When considering the introduction of prefilling, the administration should take into account *other existing and planned electronic solutions*. For instance, administrations planning to procure a COTS solution for core tax functions and also plan to offer prefilling of tax returns should ensure that the chosen COTS solution supports prefilling, and plans for electronic filing and payment should be harmonised with prefilling plans.

Critical success factors for implementing prefilling of tax returns are:

- Single taxpayer identity solutions should be used for all data to be prefilled to ensure high prefilling quality; data relating to the wrong taxpayer in a prefilled form is likely to cause significant damage to the tax administration reputation, often resulting in reduced compliance and negative impact on revenue.
- If possible, automated third-party reporting should constitute the bulk of the data used for prefilling; this will contribute to reducing the number of manual mistakes made by third parties and significantly reduce the reporting burden for these stakeholders.
- Verifying the quality of the data used for prefilling, whether it comes from internal systems or external parties, is crucial. Experience shows that taxpayers often take the easiest path, which could include accepting incorrect information without checking it; basing tax assessment on incorrect information is undesirable for both taxpayer and administration.
- Legislative support for prefilling is usually required.

Case studies for taxpayer service solutions

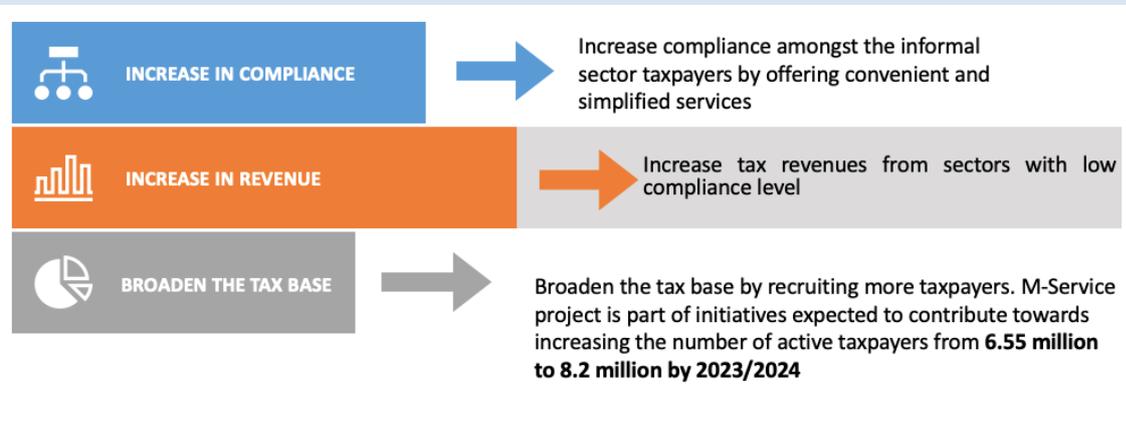
Kenya Revenue Authority: Mobile application

Kenya Revenue Authority (KRA) has over the years transformed its processes by adopting technology to improve taxpayers' experience. Through its transformation programme, KRA has integrated processes and facilitated taxpayers through technological systems.

In 2020, KRA added to its menu a Mobile application (App) called M-Service. M-Service is an App created to facilitate tax compliance by making tax services available on mobile phones. This brings

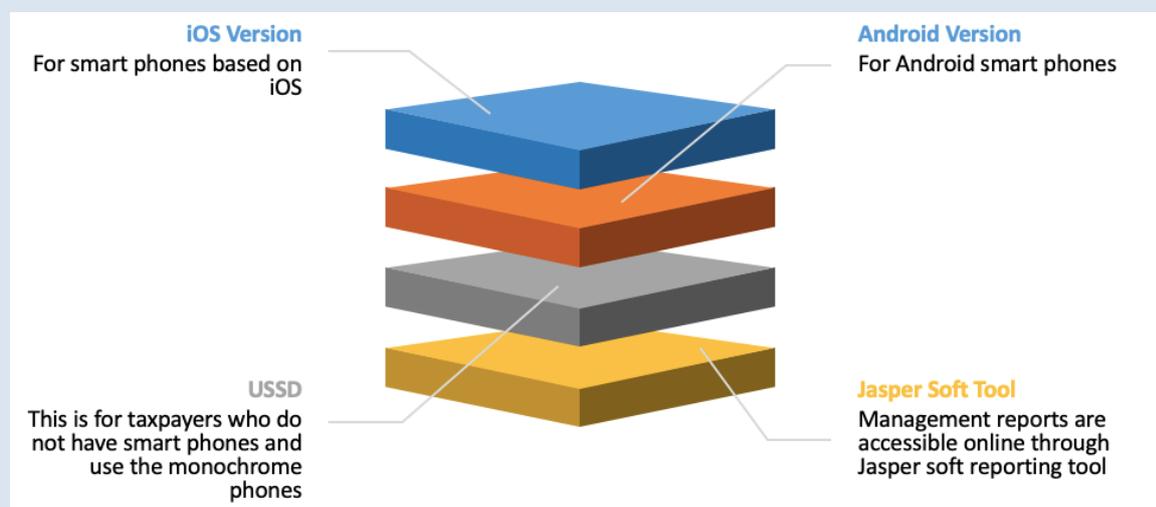
convenience to the taxpayers and at the same time makes tax services accessible to those who had challenges accessing services through the web, particularly informal sector players.

Expected benefits



MService products

The application for smartphones and supports two languages: English and Swahili. For taxpayers who do not have smartphones and use monochrome phones, KRA has provided for Unstructured Supplementary Service Data (USSD) which is accessible by dialling a USSD short code.



Implementation Process

Implementation of M-Service is through a phased approach.

- The first phase was rolled out in October 2020. This phase provided for simplified services that included taxpayer registration, filing and payment of Monthly Rental Income and Turnover taxes, information services and checkers for verification of tax compliance certificate.
- Phase 2 is currently under development and is expected to be completed in December 2021. Services to be offered are, filing of tax returns by taxpayers with employment income and customs related services.

- Phase 3 is scheduled for 2022 and is expected to support taxpayers with filing and payment of all other taxes not covered in previous phases.

Lessons learnt from the M-Service Project



ALIGNMENT WITH BUSINESS OBJECTIVES

Agree with business departments on delivery of modules and have them commit on their performance contracts before including in the project plan. This will reduce the likelihood of failure to deliver due to lack of co-operation.

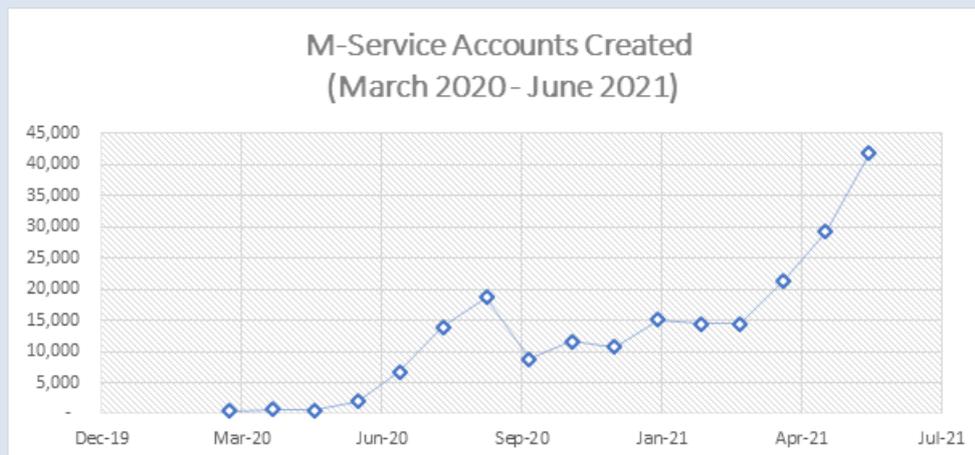
RE-ENGINEERING BUSINESS PROCESSES

Simplified and streamlined processes lead to better results and outcomes.

PROJECT PLANNING & REALISTIC EXPECTATIONS

Discern early what is feasible and if not possible to deliver in the first year, plan to deliver later.

M-Service Usage



Source: E-mail from Kenya Revenue Authority, October 2021.

Georgia: Automated VAT refund system

Background

By the end of 2015 there was a significant amount of VAT credit accumulated in the Georgia government accounts (1.087 billion GEL). This was because in the past, while it was possible to offset VAT credits to cover tax arrears, a cash VAT refund claim would automatically trigger a full-scale tax audit. This

meant that taxpayers often would choose not to claim VAT refunds in order to avoid related audit costs. As a result, legitimate businesses were being deprived of money that could help them grow their business.

Phase I: Partially automated VAT Refund System

In 2019, a Finance Minister's Decree introduced an Automated VAT Refund System. According to the Decree, VAT returns claiming deduction would be processed through automated risk assessment tools, and where no risk was detected, the claimed VAT amount would be transferred to a so called "Green Card" account. This is an account allowing taxpayers to manage their excess credit VAT according to their preferences; they can either get the money refunded or offset it against other tax arrears. If the taxpayer chooses repayment, the claimed amount is transferred directly to the taxpayers' bank account within one working day.

When the system was introduced, taxpayers were still nervous about requesting a VAT refund, as illustrated in the table below. According to the statistics, 72% of surveyed taxpayers would refuse to claim refund and, as a result, would deprive themselves of the opportunity to expand their businesses.

Year	Number of claims	Value of claims (in GEL)	Number of claims moved to the "Green Card"	Value of claims moved to the "Green Card" (in GEL)	Number of claims paid	Value of claims paid (in GEL)
2019	203 698	2 106 053 201	186 552	1 525 318 581	5 370	321 954 682

Though excess VAT credits could be refunded simply by clicking a payment button, the system could not be considered as fully automated, since the excess VAT amount was transferred to an intermediary account ("Green Card") instead of the taxpayer's bank account, requiring manual intervention from the taxpayer's side to transfer the excess amount to their bank account.

Phase II: Fully Automated VAT Refund System

In November 2020, a fully automated VAT refund system was introduced, in order to stimulate economic growth by increasing the cash flow in businesses.

The fully automated VAT refund system covers the VAT returns filed from January 2019, and the system subjects all VAT returns to automated risk screening. If no risk is detected, the money is automatically transferred to taxpayer's bank account. To achieve this the following steps are followed:

1. Tax returns are automatically assessed;
2. Automatic rejection of incomplete forms;
3. Identification of VAT refund risks;
4. Validation;
5. Identification of risks for VAT registered taxpayers.

Among the above listed steps, validation is the most important one. Through the validation process, Revenue Service (RS) identifies any mismatches between the data provided by the taxpayer through the VAT return form and data available in the RS database. The purpose of validation is to uncover any errors in the VAT return forms and to help the tax compliance culture among taxpayers to improve. When an error is detected, a tax officer contacts the taxpayer and asks them to correct the VAT return error within a certain deadline.

According to statistics, in most cases when VAT errors are detected, taxpayers welcome the opportunity to correct their mistakes. As a result, only 3% of VAT returns end up being audited. The e-invoicing

system, introduced and made mandatory years ago in Georgia, is very useful for data cross-matching data in this process.

The switch to a fully automated refund system was backed by a strategic approach which included

- allocating the additional financial and human resources needed;
- introducing tax legislation changes corresponding with the new system; and
- structural changes, including the establishment of two dedicated units, one responsible for audit of high-risk VAT returns and another responsible for outreach to taxpayers asked to correct filed VAT returns.

The automated VAT refund system has created a step change for businesses operating in Georgia, and the freed up cash has reduced the need for bank loans.

The table below illustrates the drastic change from 2020 to 2021.

	2020 (January-August)	2021 (January-August)
Number of Claims Paid	7 480	113 475
Value of Claims Paid (in GEL)	493 005 797.97	1 158 274 156.32

After the first phase was introduced, taxpayers' attitudes have dramatically changed in a positive way, thanks to the publicity campaigns run by the Revenue Service (RS) and the subsequent trust gained among taxpayers. The fully automated refund system also helped smoothen the COVID-19 pandemic effects on Georgian economy and stimulate business activities.

Lessons learned

The combination of a well-functioning risk management system, an electronic tax administration system with multi-channel data collection capacity, a strategic and step-by-step approach, timely legislative and corporate support and awareness-raising campaigns assured a smooth transformation from the previous cost- and time-bound refund system that led to distrust amongst taxpayers. The new refund system is simple, time-efficient and business friendly.

This transition has been supported by data from a mandatory e-invoicing system and other available electronic data which were essential to enacting the system. It also made it possible to analyse data in a faster way and eliminate potential VAT fraud risks.

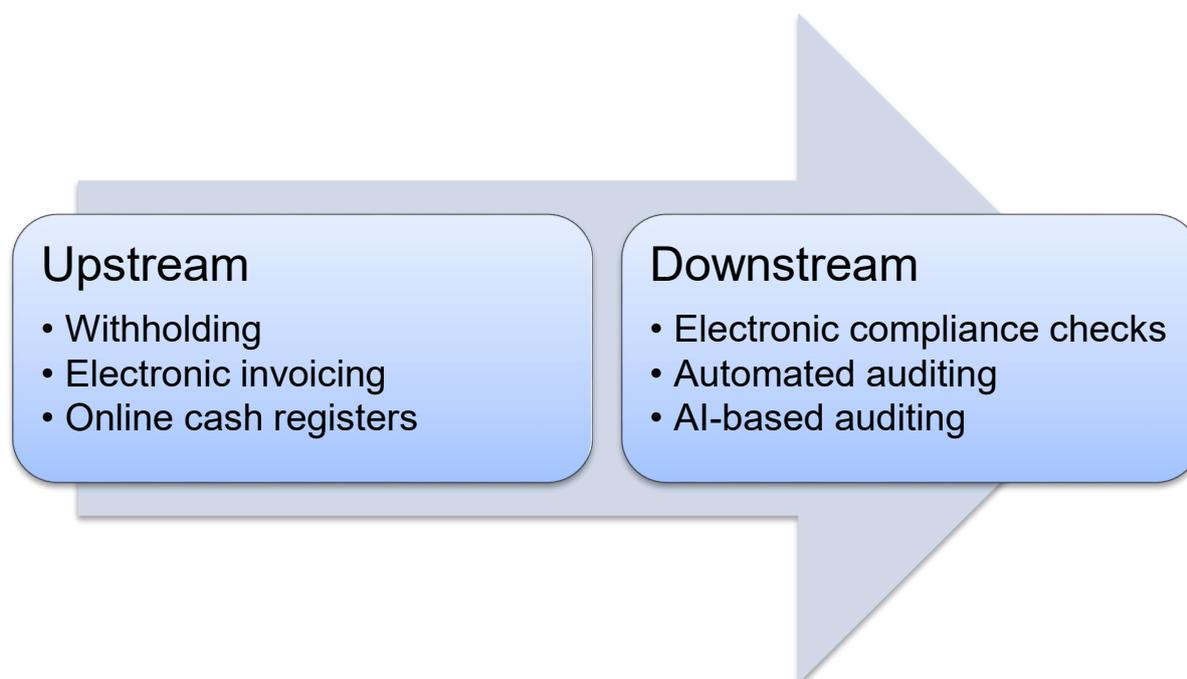
Source: E-mail from Georgia Revenue Service, November 2021.

Compliance risk management

Taxpayer compliance encompasses a series of activities related to registering the appropriate information with the tax administration, reporting the necessary and correct information for tax assessment, and paying the assessed tax by the deadline. Taxpayers may fail to comply with their obligations intentionally or unintentionally, and administrations need to approach the compliance risk management systematically,

ensuring that mitigation of the most serious risks are prioritised.³⁰ Risks related to noncompliance can be mitigated through activities which either seek to reduce the probability of the noncompliance occurring, often referred to as *upstream* activities, or detect it after it occurred, commonly known as *downstream* activities. This section covers both upstream and downstream compliance and risk management digital support components, mentioning some that are currently in common use, as illustrated in Figure 5.3. As this area is changing rapidly, other components are likely to grow in commonality soon.

Figure 5.3. Upstream and downstream compliance and risk management



The common theme for digitalisation of compliance risk management is availability of data: Digitalisation of other areas of the administration, like electronic filing and payment, may increase the chances of successful digitalisation of compliance activities by producing large quantities of data of high quality; while activities like electronic invoicing generate data useful for enforcing compliance.

If the digitalisation of compliance risk management is the currently chosen area of priority for the administration, it may be pertinent first to decide which deliverables to choose and where to start. Factors that should be considered include the cost-benefit situation and the legislative aspect. For instance:

- The relative cost picture is likely to differ widely between the three upstream components covered in this section, both along the tax administration versus taxpayer dimension and the investment cost versus maintenance cost dimension. The same is true with regard to administration cost for the variations of downstream activities covered.
- Each of the three upstream components give benefits in individual areas and to particular taxpayer groups, while automated auditing is likely to have positive impact across all taxes for the administration, but not give much effect for taxpayers.

³⁰ For more information on Compliance risk management, see for instance (OECD, 2004_[102]).

- On a similar vein, each of the upstream components require legislative changes, and their introduction therefore needs to be coordinated with relevant legislative processes, while automated audits commonly can be implemented at the initiative of the tax administration.

Downstream activities

Many downstream activities related to compliance and risk management belong to the broad category of auditing, though some administrations would choose to place for instance tax crime investigation in a separate category. A common aim of digitalisation is to reduce the need for auditing. Nevertheless, the auditing function is likely not to be taken out of tax administration processes for many years, so finding ways to automate this function holds significant potential for cost saving. Furthermore, although auditing processes may already make use of significant digital support and source material, many administrations still find auditing to be relevant for digitalisation, and look for ways to increase their efficiency and effectiveness in this area. Digitalising auditing processes can include but is not limited to

- electronic compliance checks;
- automated auditing; and
- auditing based on artificial intelligence (AI).

Electronic compliance checks are fairly simple rule-based checks that ideally are done at the time of registration or electronic tax return processing, ensuring that only registrations or tax returns that pass all checks are accepted. This goes beyond simple rule checking like verifying that numeric fields only contain numbers; for tax returns it may for instance include business rules like comparing the currently reported value of an asset with last years' value, and issuing a warning or an error message if the change is outside expected bounds. While electronic compliance checks are increasingly common in tax administrations worldwide, there is likely to be potential in many administrations for increased benefits from new checks based on data made available through digitalisation. Depending on implementation, electronic compliance checks may act more as Midstream than Downstream activities, since they may be introduced into the process of taxpayer data entry, ensuring that incorrect data does not make its way into the tax administration system.

Automated auditing mimics the auditing done by tax officials. It increases in relevance as more and more of the auditing source material is electronic. One common method for implementing automated auditing is using Robotic Process Automation (RPA). Instead of a tax official searching through data sources and using different electronic tools in order to verify the correctness of the records, a level of overlay software can take over this task. The human auditor first uses the overlay software to monitor and record their keystrokes while they perform the successive auditing tasks. At the end of the audit, the recording is stopped, and the overlay software is used to adapt the recording of the work as generic work instructions for the robot. For instance, in the place where the human auditor typed in a taxpayer ID, there may be instructions for the robot to copy and paste the next taxpayer ID from the list of taxpayers to be audited. Subsequently, the robot can perform the same audit steps as were done by the human, on data from other taxpayers. Using RPA works best on repetitive and time consuming audit processes with no need for judgment by the auditor.

With *auditing based on Artificial Intelligence (AI)*, the AI-solution searches through large data sets, often combined from several sources, for outliers or anomalies indicating that the information provided by a taxpayer may not be correct.³¹ The data sources can include any data available to the administration that indicates financial activity, so sources such as public Facebook data may be used. The results are

³¹ This differs slightly from the more common Analytics case of using AI to select taxpayers for auditing, although the information used may be similar.

commonly followed up with a regular auditing process performed by a human, since the anomalies detected may have natural causes that are evident to a human auditor but undetectable to the AI-solution.

Downstream digitalisation deliverables: Benefits and key considerations

There seems to be significant room for cost saving by automating auditing; the 156 tax administrations participating in ISORA 2020 used on average 26% of their staff for audit, investigation and other verification in 2019, while 20 of the administrations used more than 40% of their staff for these functions. (ADB, CIAT, IMF, IOTA, OECD, 2021^[22])

Administrations considering automated auditing should start by mapping which of the three suggested variations are relevant for their situation; it is possible that none, one, two or all three can be used according to local circumstances. For instance:

- For electronic compliance checks, the approach would vary considerably depending on whether the administration has a SaaS or COTS solution for core tax function or has developed the solution in-house.³² It is not given that all SaaS and COTS solutions are capable of being expanded to include such checks. For administrations considering this digitalisation deliverable, the availability of high quality data to be used for verification is likely to set the outer limits for which checks to implement – the opportunities may be quite plentiful.
- In order to implement automated auditing, the administration would need to license appropriate software, for instance Robotic Process Automation solutions, as well as ensuring in-house ICT or continuous ICT consulting support for training and maintaining the solution.
- Introduction of any form of AI-based solutions, including AI-based auditing, requires access to large and consistent data sets of high quality, hardware and software specially designed for the purpose, and AI-experts, preferably on staff in order to retain the knowledge within the organisation. The administration should verify that such prerequisites are in place or will be in time before initiating this type of automated auditing. Administrations without previous experience in the field of Analytics may find other deliverables more suitable than AI-based auditing as the initial endeavour.

Once the choice has been made to start implementing one or more automated auditing solutions, the administration should ensure that the project team involves business process reengineering experts and experienced auditors as well as ICT experts. It is likely that the process of changing the way the administration handles auditing will uncover opportunities for making auditing procedures more efficient and effective.

Upstream activities

Digitalisation is key to upstream activities seeking to improve voluntary compliance, and it is becoming increasingly common to use behavioural insight to influence a taxpayer upstream to comply with their tax obligations. These techniques can be combined with the digital communication techniques set out above to send low cost targeted messages to taxpayers, for example reminding them of the how the revenue collected is used, how many other taxpayers comply with their obligations, or the impact of not complying. Digital communication techniques offer the chance for behavioural insight to work efficiently at a large scale, as it can be automated and based on analysis of taxpayer data. More detail on successful behavioural insight techniques can be found in a recent OECD-report. (OECD, 2021^[7])

However, digitalisation also has the potential to change compliance approaches by introducing more *compliance by design*. This concept implies that ICT systems involved in taxation functions are designed in such a manner that compliance is built into the systems taxpayers use, and so taxpayers can meet their

³² See Chapter 4 and Annex D for more information on SaaS and COTS solutions.

tax obligations seamlessly, reducing the need for downstream compliance verification. In this section, three common compliance by design deliverables are covered: Withholding, Electronic invoicing systems and Online cash registers.

Withholding the tax portion of a taxable gain at source and subsequently paying the amount to the tax administration ensures compliance by removing the opportunity for the taxpayer to avoid payment. The most common variant of withholding is probably Pay-as-you-earn (PAYE); 146 of the 156 participants in ISORA 2020 - almost 94% - reported that they had some form of PAYE programme in 2019, though the question did not go into level of digitalisation of the PAYE programme. (ADB, CIAT, IMF, IOTA, OECD, 2021^[22]) Consequently, this is the variant given most focus in this section, although some ideas for other variants are included below.

With variations as mandated by local legislation, a PAYE solution implies that employers are required to withhold Personal Income Tax from the salaries of their employees, and send the withheld amount to the tax administration, often accompanied with information about employee salary and other pertinent data. In a digitalised context, the tax administration will require the employers to send the information electronically, and the solution is commonly combined with a digital payment solution for transferring the withheld amount. It is increasingly common for the employers' payroll systems to automatically ensure the withholding and payment and the transfer of the information.

Other variations of withholding target other taxable financial gains, but follow the same the principle where the entity responsible for paying the taxpayer withholds the amount due in tax and transfers the withheld amount, commonly also with related data, directly to the tax administration.

Electronic invoicing is by many considered a core component of a Compliance by design strategy for GST/ VAT, as it is likely to reduce the compliance burden of reporting, as well as limiting the opportunity not to comply for the taxpayers involved by giving the tax administration direct access to the invoices issues by the seller. It is also commonly counted as a national digitalisation component rather than one of the tax administration alone, due to its complexity, large range of stakeholders and societal implications. It is becoming increasingly common; 50 of the 156 participants in ISORA 2020 - 32% - reported that all or some taxpayers were required to use an electronic invoice mechanism for tax purposes in 2019. (ADB, CIAT, IMF, IOTA, OECD, 2021^[22])

The *two common models* of electronic invoicing in a tax context reflect where in the taxation process the solution is used, and the variations have significant differences in implementation cost and compliance cost:

- With the *clearance* model, the invoice is sent to the tax administration in real-time or near real-time for clearance as part of the invoicing process. This has complexity and cost implications, for instance due to the need for an infrastructure handling the real-time data streams as well as certification and electronic signature solutions for all participating businesses. The model may also create friction between taxpayer and administration, which for some jurisdictions is considered undesirable while others consider it acceptable as it allows the tax administration upstream access to data and the opportunity to stop noncompliance before it happens.
- The *post-audit* model is, as the name implies, based on traditional auditing which happens after the transaction has completed, though the auditing occurs digitally and largely automated. While the downstream access means that the administration has to sanction compliance breaches instead of stopping them as they are about to happen, the model is significantly simpler and cheaper to implement, while still giving the administration access to the useful invoicing data.

Whereas electronic invoicing solutions are aimed at improving compliance in the business-to-business (B2B) market, **online cash registers** constitute a similar measure for the business-to-consumer (B2C) market. 77 of the 156 participants in ISORA 2020 - 49% - reported that all or some taxpayers were required to use electronic fiscal devices or cash registers in 2019. (ADB, CIAT, IMF, IOTA, OECD, 2021^[22])

Since cash registers are used to register the financial transactions between a business and a consumer, having access to the cash register transactions allows the tax administration to ensure that the business complies with taxation legislation related to sales.

The term online is used to signify that for this type of cash register every payment transaction is sent automatically to the administration, either directly or via an intermediary. The transaction can be sent on demand, or it can be transferred in real-time to avoid the possibility of post-transaction manipulation. Since the information is sent encrypted, it is not possible with current technology³³ to check or change the information during the transfer.

Upstream digitalisation deliverables: Benefits and key considerations

As is well known in tax administration, the earlier in the taxation process compliance can be ensured, the less costly it becomes for the administration. Influencing taxpayers to comply voluntarily improves the probability of compliance, and designing systems for taxpayer interaction with compliance built-in simplifies and reduces the cost of compliance for the taxpayer while also reducing the opportunities for noncompliance.

Withholding: benefits and key considerations

The benefits for the tax administration and the taxpayer of introducing digitally based withholding is clear. If for instance an employer takes over the responsibility for collecting the personal income tax from its employees, sending the salary data and the withheld amount to the tax administration, the administration is left with virtually no collection work and considerably easier auditing work, while the employer takes responsibility for significant parts of their employees' income tax compliance obligations.

Although digitally based withholding solutions primarily benefit the taxpayers and the tax administration, many countries also manage to make the solution attractive for business, for instance by combining the withholding arrangement with a whole-of-government solution, sometimes called "Tell us once", where the withholding agent fulfils a range of reporting obligations to different parts of government through a single reporting interface. In the case of PAYE, the salary and withheld tax data can be used by for instance the tax administration, the social services and the statistics bureau. Furthermore, with financial software that automatically withholds the tax, integrates with a digital payment solution to automatically pay the tax to the administration, and automatically transfers the necessary data, the added cost of compliance coming from withholding regimes is likely to seem reasonable to most businesses.

For administrations with existing PAYE solutions, it may be relevant to consider different ways of *expanding the solutions*:

- The administration can incorporate "Tell-us-once" solutions as mentioned above, in collaboration with other government units, in order to increase benefits on a societal level. A crucial success factor for such projects is the ability of all government units to cooperate and co-design digital interfaces as well as maintenance routines.³⁴
- The administration may also consider expanding the withholding concept to other areas than salary. It may for instance be possible to introduce automatic withholding of interest, capital gains or other taxable financial gains according to local conditions. An emerging and increasingly important area of possible withholding relates to the sharing and gig economy: Even if the platform providers connecting service providers with clients are not considered employers in the traditional

³³ Quantum computing may introduce a paradigm change with regard to encryption, but this is currently mostly at an experimental and research stage.

³⁴ For more information on this, see Chapter 4.

sense, they may have or be given reporting obligations similar to those legislated for employers. It is a relatively small step from reporting to withholding, and since the platforms tend to be exclusively digital, adding withholding functionality to existing reporting functionality is likely to be reasonably easy. The complexity of such solutions is more likely to come from the international orientation of this economy, where a platform may engage clients from several jurisdictions. A group of FTA members is currently exploring collaboration opportunities in this area; progress will be reported on the FTA website.³⁵

For *initial implementation of PAYE* solutions, key considerations for legislators, with input from the administration, include determining what calculation method to use for the withholding:

- A simple PAYE system is based on a table of monthly withholding based on the employee's yearly salary. The disadvantage of this method is potential discrepancies between withheld tax and calculated tax due to salary changes during the year.
- A cumulative PAYE system re-computes the tax due every month in order to make the total tax due as close as possible to the total amount withheld. This complicates the PAYE computation but reduces the need for end-of-year refunds.
- A year-end adjusted approach combines the two other approaches; it uses the simple table system for all except the last month of the financial year, when the cumulative approach is used.

The legislative body preparing PAYE legislation should, assisted by the tax administration as appropriate, also determine the regulations for transfer of data from employer to tax administration. If such transfer is deemed necessary, it is advisable to specify that data must be automatically transferred to the tax administration at regular intervals – for instance monthly – instead of at the end of the year. Although this might mean a higher initial cost for the employers, it will significantly reduce manual work in the long run and would match a typical payroll routine. For the tax administration frequent data would, if implemented right, allow for analysis of the incoming data for statistics and compliance purposes.

PAYE data transfer between employer and administration could be done through an Application Programming Interface (API)³⁶; by coordinating the API design and development with the legislative work, private partner coordination, and internal preparations for receiving the data, the solution can be rolled out as soon as all elements are ready.

The PAYE project should be coordinated with stakeholders from the finance software industry to allow the software developers to add functionality for withholding of tax from employee salaries and sending that money to the tax authority to be done automatically by the payroll software. This significantly reduces the taxpayer disadvantages of employer reporting and payment requirements, and is likely to increase taxpayer support for the project – which may be very useful when seeking financing.

Electronic invoicing: benefits and key considerations

Electronic invoicing may significantly improve the efficiency of the tax administration and the business community, reduce the cost of compliance monitoring for the administration, improve the trust-relationship between tax administration and taxpayers, allow for fairer competition among businesses, and is likely to increase revenue by making it more difficult not to comply. Such solutions increase the quality and usually the granularity of the information used for taxation, and may be used for prefilling GST/ VAT forms. They can also benefit taxpayers by shortening refunding timeframes. For society at large, they may also have a considerable positive environmental impact through the reduction of paper use.

³⁵ <https://www.oecd.org/tax/forum-on-tax-administration/>

³⁶ See Annex D for more information on APIs.

Tax administrations considering introducing electronic invoicing should first and foremost find *collaboration partners* across government and possibly the private sector for the project because of the solution's complexity and societal impact. The administration and collaboration partners should early on agree which of the two common variations (or some other variation) to develop, depending on local conditions. The clearance model is likely to require larger investments and may generate greater contention in the business sector, but can also be expected to offer larger benefits.

For governments considering the introduction of electronic invoicing, it is absolutely essential to also plan for the *costs after the completion of the project*. Whereas other systems commonly require 20% of the investment cost for continuous maintenance, the yearly upkeep of an electronic invoicing solution may cost many times more than the original investment: The Italian Revenue Agency writes in a white paper from 2021: "The realisation of the project required an investment of 2.5 million euros in 2015. In order to extend the e-invoicing process to domestic transactions (B2B and B2C) another investment of 1.2 million euros has been done. In contrast, the system management costs are significantly higher, amounting to 20 million euro a year."³⁷ The running cost will of course vary with type of system and other variables.

Prior to implementation, the project should set the objectives for the implementation; identify and handle potential issues like legal framework, digital infrastructure, digital competence; share and collect the necessary knowledge; and look for existing standards instead of creating another national standard, to reduce the burden on MNEs.³⁸ A group of FTA members is currently exploring opportunities for standardising e-invoicing requirements for tax; progress will be reported on the FTA website.³⁹ Further guidance related to electronic invoicing projects, based on the experience of the Italian Revenue Agency, is included in Box 5.4.

³⁷ Source: Document received from the Italian Revenue Agency May 2021.

³⁸ One possible standard is OpenPEPPOL. <https://peppol.eu/about-openpeppol/>

³⁹ <https://www.oecd.org/tax/forum-on-tax-administration/>

Box 5.4. Italy: Key factors to consider when developing the e-invoicing project

Close collaboration with stakeholders: The implementation of the electronic invoicing was also favoured by a close collaboration with all public and private stakeholders who were constantly heard in the design phase in order to intercept and evaluate their needs. The role of intermediaries was important as they have supported the Administration in identifying and deepening the peculiarities of the different economic operators. In order to establish and conduct close cooperation between the Administration and intermediaries, the forum on electronic invoicing has been established since 2011 where all issues related to the subject are examined with the aim to find shared solutions.

Internet connection: The creation of a new integrated relationship between customer and supplier to start digitalisation of national tax simplification processes requires a widespread national ICT infrastructure able to offer to all citizens the benefits of the digitalisation in the tax fulfilment. The concern is that people without access to the Internet and other information and communication technologies will be disadvantaged, as they are unable or less able to obtain a real benefits.

Electronic devices: In Italy, the “usability” and the “user experience” are important key points when a new digital services is developed. In fact, an electronic invoice can be managed in all electronic devices. For example, you can use a smartphone, tablet, PC in order to generate an xml file and, if you use a specific channel, you can send it through a simple smartphone. In addition, AE uses a “mobile first” approach too. This is really appreciated.

Free services: Development of free online services facilitates the fulfilment of tax obligations. It is very important to identify areas where complexities in the tax system for both business and individual taxpayers can be reduced in order to increase the “tax compliance”. In fact, the Italian tax authority provides a complete set of free online services, covering all aspects of the e-invoicing process, including digital preservation.

Human resources: Among the factors that have fostered the success of the e-invoicing project is the importance of a well-trained staff, so as to face questions coming from the taxpayers. Thus, the Italian Revenue Agency, have organised specific training courses dedicated to the staff involved in assistance to taxpayers. In addition, a network of 60 contact persons has been created aimed at improving and sharing knowledge and facilitating exchange of expertise related to e-invoicing so as to provide the taxpayer with accurate information. Moreover, in order to be constantly aligned and updated, the network of contact persons have a dedicated forum for the meetings, which are held on a regular basis.

Source: Electronic Invoicing in Italy, a white paper from Agenzia Entrate (Italian Revenue Agency) May 2021, available here: <https://oecd.org/tax/forum-on-tax-administration/publications-and-products/Italy-Electronic-invoicing-May-2021.pdf>

Online cash registers: benefits and key considerations

By using online cash registers (OCRs) to access the actual transactions on which business taxation is based instead of relying on the business to report a summary of the transactions, the tax administration maximises the accuracy of tax assessment and removes a taxpayer compliance task. Online cash registers are therefore likely to improve compliance, reduce compliance cost for taxpayers, allow for fairer competition among businesses and protect consumers by guaranteeing the validity of the transaction.

In order to fulfil its purpose, a solution for online cash registers has to *ensure a secure chain* from the moment of sale to the use of the transaction at the tax administration. This starts with product integrity, ensuring that the online cash register does not have hardware or software weaknesses allowing for sales

suppression, and can be ensured for instance through quality approval of registers or regulatory requirements for register standards. Secondly, the integrity of the transaction should be secured, for instance through storing a digital signature along with the transaction data. Thirdly, the transactions should be auditable, for instance with on-site audits.

Building a secure network of units that transmit financial transactions to the tax administration as well as an infrastructure to receive and process this data will be costly for the tax administration and the taxpayers alike. Administrations considering implementation of OCRs should *verify that the benefits outweigh the costs*; as the costs are significant.

Assuming that the business case for introducing OCRs shows the benefits to outweigh the costs, *other important considerations* related to this digitalisation component include

- verifying current and expected future status of the legal foundation for OCRs, to ensure that it is in place in time for roll-out;
- mapping the stakeholders affected by the solution and engaging these in design, testing and roll-out in order to increase support; and
- designing secure transmission of the OCR data to the tax administration, preferably in real-time to reduce the opportunity for tampering, although buffering and periodic transmission may be necessary depending on network quality.

The administration may seek to learn from the experience of the countries that have an online cash register solution, such as the OECD-report offering guidance on implementing online cash registers. (OECD, 2019^[30]) This report also contains an annex with a how-to-guide for online cash register implementation.

Case studies for compliance risk management

Chile: Electronic filing and prefilling

One of the most wide-ranging processes in the Chilean Tax Administration (SII) tax system is the Annual Income Tax Return process, which was filed online in 2019 by 99.7% of corporate taxpayers (68.4% using a partially prefilled return) and by 99.9% of individual taxpayers (94.9% using the fully prefilled return).

Achieving this has required constant and determined progress over time, in order to be able to generate the different forms required for the online income tax return process. In particular, coordination was required with the different key actors that provide the information.

The first online form for filing the income tax return was made available in 1993; this was a simple copy of the paper form in electronic format. Since then, several improvements have been made to simplify filing. This has included developing calculation assistance tools to facilitate form completion, and generating return proposals according to the tax regime to which the taxpayer is subject. For the latter, in addition to seeking to improve the online filing and subsequent controls of the tax return, it has been deemed essential to use third party information for prefilling.

As early as the year 2000, it was possible to complete and file some forms online, as well as to use free software which allowed for preparation of forms without the need to be connected to the internet, automatic validation of formal and arithmetic consistency, and subsequent online submission. The number of forms to be filed have also been reduced, from 75 in 2017 to 62 in 2021; all of these are filed electronically.

Finally, it should be noted that, in the event of any legal change that affects what taxpayers have to declare, the corresponding adjustments are immediately made to both the tax return form and its related

sworn statements, including those to be submitted by the taxpayer and by third-party, so that they can file all their declarations online.

Source: E-mail from Chilean Tax Administration, October 2021.

Malaysia: Checking tax compliance status

The Inland Revenue Board of Malaysia (IRBM) is currently designing a Tax Compliance Certificate (TCC) to nudge and assist taxpayer to greater compliance. The objective of the TCC is to provide taxpayers compliance status when submitting government tender applications. The tax compliance status check tells the taxpayer if they are up to date with their tax filing and payment, and increases the ability for IRBM to provide taxpayers with real-time information and guide them with suitable compliance strategies. The implementation of TCC is still subject to policy maker approval. The following figure illustrates the tax compliance status check.



Tax Compliance Certificate (TCC) status checking

This enables the taxpayers to check their compliance status for Tax Compliance Certificate (TCC) purposes.

Please enter tax file number and press Check button

Tax file number:

Checking result:
Comply

Disclaimer Note: This check is valid only on search date and time only and can not be used in court.

Source: E-mail from the Inland Revenue Board of Malaysia, September 2021.

Peru: Electronic payment receipt

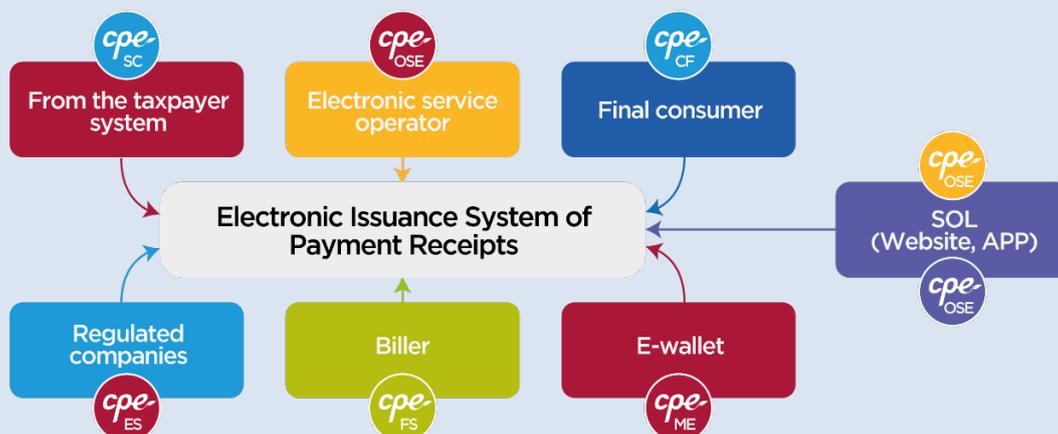
In Peru, the National Superintendency of Customs and Tax Administration (SUNAT) is a national-level public agency in charge of the collection and administration of internal and customs taxes. It manages the processes of tax declaration and payment, inspection, dispute resolution, among others.

In recent years, SUNAT has designed a new strategy with the purpose of encouraging voluntary compliance with obligations, this reducing compliance costs. This strategy has four pillars: risk management, digital transformation, international taxation and collaborative compliance.

The digital transformation pillar began several years ago. It involves rethinking and reworking products, processes and strategies, and incorporating technology to collect, generate, analyse and transmit large volumes of data. It also involves transforming them into information that adds value to processes while making use of concepts such as artificial intelligence, Big Data, data science and other existing tools.

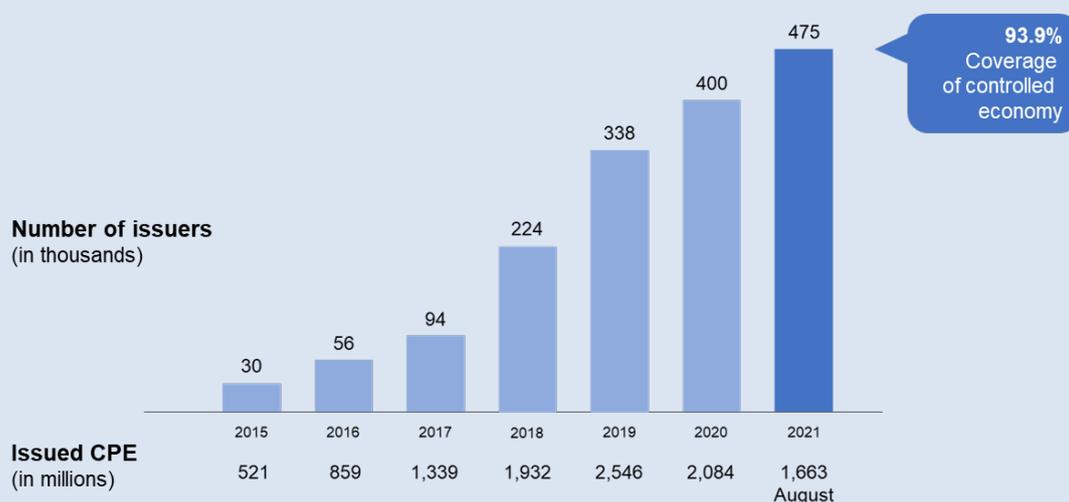
One of the biggest products of this work is the analysis of electronic payment receipts (CPE in Spanish), which provides consistent and detailed information on the operations carried out by taxpayers and users of foreign trade, facilitating fraud detection and risking programmes. It also is likely to help businesses be more efficient, through improved operational processes.

Electronic Issuance System of Payment Receipts



Since 2014, its use became mandatory by large taxpayers, then medium and small enterprises in 2017, financial system entities in 2019, and companies that provide public services in 2020. As a result, as of August 2021 there are more than 475,000 issuers, who have supplied more than 10 billion CPE since 2015.

Number of electronic issuers and issued CPE during 2015-2019



To promote use, the Electronic Service Provider (PSE for its initials in Spanish) and the Electronic Service Operator (OSE for its initials in Spanish) have been incorporated into the process. The former provides its services to an electronic issuer to carry out the CPE issuance and other activities inherent therein on their behalf. The latter electronically checks compliance with all essential aspects to consider the issued e-document as a CPE and thus provide certainty to the client that they have a valid CPE that

can be used to support commercial operations before SUNAT. Currently, there are 132 PSEs and 14 OSEs.

These systems have allowed the development of an electronic services market, which in turn offers a diversity of electronic invoicing solutions and alternatives, especially to MSEs, allowing the reduction of transaction costs for issuers without prejudice to guaranteeing data security and confidentiality.

Uses and benefits of e-receipts in taxpayers and public sector entities

There are many benefits that have been identified in different sectors of the economy with the implementation of electronic issuance in Peru. For example, the retail sector no longer needed printers in each place or point of issue and large amounts of paper to print receipts. Mass consumption companies also had a potential for reduction in storage and shipping costs for physical documents. Businesses selling fuel to end consumers could streamline their invoicing process by reducing receipt printing time. In general, there was potential for increased efficiency in companies' internal processes, including managing to electronically integrate with suppliers.

For their part, public entities also achieved efficiency with the implementation of electronic issuance, such is the case of the National Superintendency of Public Registries⁴⁰, which uses CPE in its vehicle ownership transfer registration processes, allowing this entity to optimise the process for the benefit of citizens.

During the pandemic due to COVID-19, the Ministry of Economy and Finance used information from the CPE in order to track in real time the sales level by sector and economic activity of each department of the country, with the aim of quantifying the impact of immobilisations on the economy and collection, as well as the progress of economic reactivation in each sector. With this, SUNAT could identify which economic activities were more affected than others.

SUNAT in its Customs business

The use of CPE has made it possible to optimise several foreign trade processes, mainly the final export process, which represents more than 50 billion dollars annually. Additionally, the CPE is used for other procedures, such as simplified export and express cargo shipments, as well as export file regularisation and simplified drawback process. All this, because CPE grants information traceability and consistency with values declared before Customs and values recorded in accounting books.

Electronic invoicing as a driver for digital transformation

Within the digital transformation pillar framework and by making optimal and efficient use of the information in CPE, customs declarations and other electronically received sources while aligned with the factoring process, SUNAT has been implementing the VAT Electronic Management, allowing the reduction of compliance cost and implementing an articulated and comprehensive control of the entire VAT flow with preventive and concurrent actions.

For this, SUNAT will process large volumes of information using Big Data. Currently, about 94% of trade operations controlled by SUNAT are carried out through e- invoicing.

This initiative includes the following:

- **Propose to the taxpayer an Electronic Sales Record**, with this SUNAT replaces the taxpayer in its construction and storage, reducing costs and avoiding mistakes. Last August, a pilot plan

⁴⁰ Entity in charge of registering, among others, transfers of real estate and vehicular properties.

for this initiative was launched, aimed at micro and small enterprises, which will be gradually extended to the rest of taxpayers, ending in April 2022.

- **Propose to the taxpayer an Electronic Purchase Record**, with which SUNAT will also replace the taxpayer in its construction and storage. Its implementation is scheduled for May 2022 and will include all taxpayers who are required to keep said record electronically.
- **Automatically generate the VAT Affidavit**, whose implementation will be made progressively from December 2021 to April 2022.
- **Optimise VAT payment systems** implemented since September 2021.
- **Implement preventive and concurrent control process**, which will allow informing the taxpayer of inconsistencies in their records, allowing rectification before generation to avoid subsequent tax contingencies.

In this way, it is estimated that 1.5 million taxpayers will be able to reduce time and resources allocated to fulfil their tax obligations and improve innovation and competitiveness of their businesses.



The VAT Electronic Management is completed with other initiatives that use information from CPE, customs declarations and other information electronically obtained by SUNAT such as the Single Taxpayer Account System and the Electronic Control of Goods Traceability, which are part of SUNAT's digital transformation pillar.

Lessons learned and 2022 – 2025 perspectives

Although Peru considered experiences of leading countries in e-invoicing in Latin America such as Brazil, Chile and Mexico for implementing the use of CPE, SUNAT learned that each economic sector in the country has characteristics to be addressed, hence adopting a “non-intrusive” policy, i.e. the rules of electronic issuance cannot harm the business but facilitate it, which is why SUNAT began to listen to and attend to various case studies in order not to affect the business operation. For this, the use of an international standard for digital format development allowed us to address these case studies and facilitate electronic issuance. E-invoice is mainly a commercial document with tax requirements. With this, unlike the aforementioned neighbouring countries, in Peru electronic issuance not only met a tax need but also a commercial one. In this way, e-invoicing became a “win to win” project.

Likewise, it was necessary to involve governing bodies of the State, such as the Ministry of Economy and Finance, in order to promote this initiative from the Executive Authority. Along these lines, said

Ministry included the CPE within the Multiannual Macroeconomic Framework⁴¹ as part of the country's public policies. Thus, in said Framework 2022 – 2025, the use of CPE is considered as a tax policy guideline for simplifying tax compliance, indicating in turn that the GDP growth (20.4%), which is expected for said period in order to achieve a tax pressure of 15.5%, considers, among others, the total implementation of SUNAT's digital transformation, which implies to conclude the CPE mass adoption.

In this sense, it is expected that by 2022, 100% of businesses, mainly the smallest in the market, must issue CPE. For this, a mass adoption strategy has been defined. This strategy considers a collaborative policy with actors such as banks, guilds and large buyers, also including the digital payment ecosystem such as credit and debit cards and e-wallets, where it is planned to recognise the payment transaction made through these means as CPE.

Source: E-mail from the National Superintendency of Customs and Tax Administration in Peru, September 2021.

Business administration systems

The term *business administration systems* is usually used for software packages for human resource management and financial management including budgeting and procurement management. Some administrations also choose to purchase software for risk management, project management, travel management or asset management. In the following, for simplicity, the two central components for human resources and finances are considered, though the principles set out can apply across all aspects of an organisation.

The *cost and complexity* of the systems vary widely with the number of staff, size of organisation budget and organisational complexity. Whereas smaller administrations may find that locally produced software packages fulfil their needs, the largest administrations are likely to search internationally for Enterprise Resource Planning (ERP) software packages which offer an integrated and consistent view of the entire tax administration business. In some cases, the government chooses to procure an ERP system on national level and offer the use of it as a service to multiple governmental entities.

Benefits and key considerations

Apart from supporting the legal obligations and societal expectations for prudent financial control and fair staff treatment, the administration is likely to find that modern business administration software allows for more efficient and effective execution of business processes, which in turn reduces cost and increases staff motivation:

- Updated and detailed information about the staff working for the tax administration, their education and their skills, is a prerequisite for planning efficient use of the human resources. For instance, an administration with complete overview of number of staff and their skill level divided by office for a particular skill can use this information for reorganising as well as for planning staff recruitment, taking into account retirement and expected turnover.
- Sound financial control is expected of any governmental entities, and tax administrations are probably expected to adhere to particularly high standards considering their position ensuring the finance of public benefits. With qualified financial staff, efficient financial processes and support

⁴¹ The most relevant document issued by the Peruvian Government in economic matters, which contains macroeconomic projections and support assumptions for a period of 4 years. It includes the year for which the public sector budget is being prepared and at least the following 3 years.

from a modern ICT system for finance, the tax administration can ensure that the money spent in order to fulfil its mandate is spent in the most efficient and effective way possible.

The market for such software as well as for consulting services related to their implementation and use is much larger than the corresponding market for core tax solutions. While there is only one tax administration for a region or jurisdiction, there may be hundreds or thousands of businesses in the same size range. Consequently, the administration should be able to select from a large range of alternatives when procuring a business administration system.

An administration considering the procurement of this type of system should ensure that its *business processes are examined* and possibly redesigned at the same time; process flaws will not be solved by replacing the ICT system. Furthermore, the large ERP systems are usually preconfigured for common business processes like budgeting, procurement, staff enrolment and staff release, and the administration has to choose between adapting their processes to the ones expected by the system or spending considerable time and resources reconfiguring the system to match their processes. As discussed elsewhere in the report, willingness to adapt processes may be crucial for a successful implementation of new pre-written software, and this success factor is also relevant for business administration software.

Regardless of the business process aspect, most pre-built software solutions and ERP packages require *configuring the software* to the tax administration before it can be used. For large systems and administrations, this process may be lengthy and complex. In some cases, the ERP vendor will have a preconfigured version matching public entities in the jurisdiction, reducing the configuration need to match the special situation of a tax administration. In more complex cases, national legislation related to financial and human resource management has to be configured in to the software as part of the implementation project. The configuration process, whether short or long, may require specialised skills and certifications which may not be available nationally, potentially increasing the cost of implementation. Consequently, the administration should plan for the cost, resources and time necessary to configure the software.

Depending on level of ambition and existing or coming solutions, the administration may also consider *setting up internal interfaces* to allow for the data from the business administration systems to be used for Analytics, while ensuring that all use of staff data is within the constraints dictated by the jurisdiction's personal data protection laws. For instance, combining human resource data for staff with data from the case handling functions of the core tax system can give valuable insight into which areas of work have potential for increased efficiency. Similarly, some administrations have found it very useful to combine procurement-related data from the financial management system with staff data from the human resource system in order to get a more complete and accurate picture of the resources uses by projects.

Using Analytics in tax administrations

As has been highlighted throughout this report, Analytics is often a part of a digitally based tax administration. In this context, Analytics is understood to mean discovery, interpretation and communication of meaningful patterns in data, and is assumed to include business intelligence, artificial intelligence, Big Data Analytics and network analysis. Practical use of Analytics in a tax administration commonly includes reporting, risk modelling, predictive and prescriptive Analytics and other variations of using data to gain insight.

Analytics may contribute directly to accomplishing objectives of digitalisation, for instance by optimising the selection of taxpayers for audit, usually resulting in reduced cost and increased revenue. However, the most significant benefits from Analytics probably stem from its function as *enabling other opportunities*: By joining data sources and analysing the combined data sets, the administration may uncover insights that can be used to achieve a whole range of digitalisation objectives. Table 5.1. highlights some common benefits.

Table 5.1. Common benefits of using Analytics in tax administrations

Area	Benefit
Management	<ul style="list-style-type: none"> ✓ Produce more accurate revenue estimates for the jurisdiction, to better plan government spending ✓ Support tax administration management, finance ministry and parliament in evaluation of potential policy changes through forecasting and what-if-analysis, including possible introduction of new revenue sources ✓ Uncover opportunities for increasing effectiveness and efficiency within the administration
Taxpayer services	<ul style="list-style-type: none"> ✓ Uncover opportunities for reducing taxpayer burden ✓ Improve the accuracy and efficiency of taxpayer information campaigns ✓ Improve the quality of chatbots ✓ Discover tax administration reputation through sentiment analysis of social media
Compliance	<ul style="list-style-type: none"> ✓ Uncover fraud attempts that involve a range of factors that otherwise would not be considered together ✓ Uncover fraud attempts through network analysis and integration of data sources ✓ Discover trends in tax fraud through linking social media data with taxpayer data where legislation allows ✓ Uncover risk of taxpayer bankruptcy in order to take pre-emptive measures ✓ Improve the accuracy of audit case selection ✓ Improve the efficiency and effectiveness of compliance management through automated auditing ✓ Produce more accurate taxpayer risk segmentation, in order to target taxpayer measures according to risk of and expected reasons for non-compliance ✓ Use patterns in tax administration data sources to reduce the probability of future delays or lack of filing or payment
Tax functions	<ul style="list-style-type: none"> ✓ Uncover lack of registration and improve registration completeness ✓ Improve debt management

Source: FTA Secretariat

Established, widespread and successful use of Analytics commonly depends on the *Analytics services* offered by the tax administration to its staff as well as collaboration between analysts and others using the services. These services tend to include an Analytics services infrastructure, Analytics management, Analytics prioritisation procedures and Analytics support personnel in ICT and business. The coordination of needs and resources made possible through common Analytics services make it possible for its users to perform their work effectively and efficiently while ensuring maximum utilisation of the resources of the administration. Not all administrations choose to centralise such services; there sometimes are several service units organisationally located alongside those that need the services.

Reaching a mature Analytics solution may require hundreds of thousands of hours of work as well as *significant investment* in IT, new staff positions and training. This may currently be beyond the means of some tax administrations. However, it is possible to keep this larger end-goal in mind while initiating small

unit-based projects. For example, with the right support and guidance, individuals or groups in the administration can create Analytics solutions for their own use, and start reaping some of the benefits. Although the solutions may not be usable across the administration, the experience and lessons learned from creating and using the solutions can be valuable for future whole-of-administration development, and other staff seeing the benefits of the unit-based solution may be inspired to request similar initiatives.

As with most areas of digitalised tax administration, Analytics depends on *high quality data*. However, unlike many other areas, the data being analysed most often does not originate within the Analytics system; data is sourced from elsewhere within and outside the administration, and in many cases opportunities to influence the quality may be limited. Consequently, Analytics-projects should make time for assessing the quality of incoming data and perform quality-improving activities as needed in order to achieve desirable results. These activities may also include reducing or removing bias in data as applicable.⁴²

To guide the assessment of the current situation and develop a long term plan, the administration can use the *Analytics Maturity Model*, which is expected to be published on the FTA website early in 2022.⁴³

As with many other areas where technology meets taxation, the key considerations for introducing or improving Analytics services should include ensuring a clear strategic direction, investing in people as much as technology and following up the investment with practical action:

- **Strategic direction:** The process of investing in Analytics services should be based on an explicit intention – which may require cultural change – to *view data as a vital asset* to be exploited rather than a by-product of the tax processes. This intention should be reflected in an Analytics strategy which clearly states what the administration expects to accomplish through the investment in people and technology, and allows for multiple usage areas for the same data set in order to increase return on investment.⁴⁴ The strategy should be approved by senior management to ensure necessary follow-through on unit level, and followed up with *careful prioritisation of usage areas*. Most administrations using Analytics find that the wish-list for sources to be included and usage areas to be developed is significantly longer than the practical budgetary restrictions, necessitating difficult choices of what to give priority.
- **Investment in people:** It is likely that an administration embarking on a journey in Analytics is likely to need to complement in-house skills in this area. Staff involved in Analytics in tax usually includes three groups: The Analytics services team preparing what others need to do their work, the advanced analysts with specialised education utilising the Analytics services for complex statistical analysis and data science, and the staff and managers using Analytics services in their everyday work. Staffing the Analytics services team and the advanced analyst team may require hiring of new staff, while for the staff and managers using Analytics services in their work, some will probably need training while others should be able to use premade dashboards and other interfaces. When staffing the Analytics services team, the administration could consider assembling a team that works in the crossover-area between tax functions, tax law, computer science and data science, each contributing to one or more of the areas.

⁴² A common definition of data bias is that the data set being used is not representative of the population or phenomenon being studied. This is a particularly large problem in machine learning, but may also affect other areas of Analytics. See for instance <https://towardsdatascience.com/survey-d4f168791e57>.

⁴³ <https://www.oecd.org/tax/forum-on-tax-administration/>.

⁴⁴ For instance, data from a case handling system for taxpayer interaction will give valuable insight into the types of issues faced by taxpayers as well as the work patterns for the tax officials working the cases. This data set should therefore, when made available through analytical services, be combined with tax administration data as well as business administration data in order to be used to its full potential.

- **Practical action:** Mature use of Analytics services includes that the services continuously adapt to the changing circumstances of the administration and society, that the users of the services work to solve relevant problems and hypotheses, and that administration staff proactively use the insight uncovered to take necessary action.

It is becoming increasingly common to rent Analytics services in the cloud, and some tax administrations have successfully implemented such solutions. This choice has a range of benefits, and may offer opportunities to administrations with lacking or low current analytical services for leapfrogging traditional infrastructures. The following leading example from Inland Revenue New Zealand provides lessons learned from such a project and may serve as inspiration for other administrations.

Box 5.5. New Zealand: Cloud-based Analytics

Inland Revenue New Zealand (IR) started to introduce basic business intelligence back in the late 1990's with the introduction of an enterprise data warehouse. During the 2000's, data science technologies caught up with the theory and IR introduced small pockets of Analytics technology in a 'proof of concept' (POC) mode. These POCs proved business value and ensured that data Analytics was a foundational enabler for IR's overall business transformation, which commenced in 2014.

In 2017, IR began the procurement process of a cloud based, as-a-service Analytics platform. IR asked the market participants to 1) design and provision a platform that would serve IR's high level Analytics enabled outcomes, 2) run and operate the platform once it was provisioned, 3) help IR to embed the business change required to support the organisation-wide availability of new Analytics technology and methods.

As part of IR's engagement in the market in 2017, IR worked to a principle of open architecture. IR anticipated the technology would change, and the analytical needs would mature, so IR needed to be able to embrace what was right for the administration at the right time. From a technology perspective, IR architecture is open commercially. Of course, IR has agreements in place and can't change components overnight. But it was no surprise to the technology partner that IR wanted to explore other componentry and solutions, with which the new partner helped considerably on options analysis and decision making.

IR has learned many lessons since the start of this journey. In particular since 2018. Key lessons, summarised:

- The cloud platform introduced a need for new technical skills, particularly data engineering which IR did not require before. Data engineering capabilities ensure that Analytics outputs can be produced reliably and at scale (unlike a business value-oriented proof of concept).
- The Analytics delivery model was siloed and not well understood for many of the administration's business consumers. IR spent quite some time designing and refining how to work with the business in order to optimise resource, investment and ensure sustainability of the approach. This refinement and change management in general, is ongoing, as it needs to adapt to and integrate with enterprise planning and prioritisation.
- It was important for IR to work the Analytics programme at two speeds once the cloud platform was in place: 1) to demonstrate business value early and frequently, and 2) to ensure that IR builds foundational data infrastructure for sustained Analytics at scale. Both of these streams were included in the Analytics delivery model and continue to be today.

- IR spent time initially looking at advanced Analytics capabilities, such as AI & ML. While it was good for IR to keep informed on 'the art of the possible', the initial cloud Analytics platform excluded these capabilities so that IR could focus on data Analytics basics – making quality data available and intuitive for business decisions.
- Migrating existing analytical processes and workloads that needed to continue on the new platform was also significant. IR wanted to ensure it was not just a technical migration but that they integrated into the new Analytics delivery model too. This increased the change management effort (including technical training on the new platform) in the early days, though it was always anticipated that the investment will pay off in the longer term.
- The data Analytics technology landscape continues to change at a rapid pace. The open nature of the platform allows IR to change out componentry to fit context and maturing capability, allowing IR to embrace new tools as they become available. IR replaced the data tier completely in 2021 with technology that didn't exist back in 2017.

Overall and in conclusion, when IR started the Analytics technology journey, cloud solution options were in their infancy. There were a lot of questions in particular regarding its security. If IR were starting from ground zero in 2021, cloud solutions would likely be the place to start. However, this is always going to be contextual to the agency's jurisdiction and legal frameworks. Whilst a 'green fields' approach without any migration work stream might seem the better option, it can make it harder to know where to start and how to work. By having some clearly defined business and technical needs across both migration and reinvention, IR was able to accomplish some very clear outcomes, capabilities and targeted maturity shifts.

Note: For further information about the solution, contact Tina.MacLean@ird.govt.nz.

Source: E-mail from Inland Revenue Department New Zealand, November 2021.

Considering synergy effects

This section has explored a range of common digitalisation deliverables along with some of their benefits. Whilst each of these can deliver significant benefits on a standalone basis, there may be additional potential from deliverables working together. This can lead to a wider range of benefits produced during the digitalisation journey, achieving a higher return on the investment.

While it is not possible to give assurance of such synergy effects, and the combinations that give maximum effect will vary with local circumstances, the potential for added benefits means that the administration should analyse how digitalisation deliverables are related and possibly let this influence the order and scope of the digitalisation projects. On the basis of this analysis, the administration can consider which digitalisation projects to include as well as their order and scope.

A good starting point for this analysis is to think about the dependencies that exist between deliverables; they may be connected as either accelerators or multipliers:

- **Accelerator** deliverables can be defined as preparing the ground work for future deliverables; by completing the accelerator first, the work preparing and rolling out a future one can be done faster and cheaper.
 - For example, a *comprehensive taxpayer view* is in its nature dependent on access to taxpayer data in all administration systems; gathering data from systems with different interfaces and identifiers may be quite time consuming. If however the administration first has developed or bought a *core tax system* where all components are integrated, the work to prepare a

comprehensive taxpayer view is likely to be greatly simplified. Consequently, a core tax system is an accelerator for a comprehensive taxpayer view.

- **Multiplier** deliverables can be defined as deliverables that when working together bring greater impact than each of them would by itself.
 - For example, taxpayers are likely to benefit considerably more from the combination of *online filing* and *online payment* than from each of these alone. Whereas a taxpayer that is offered the opportunity to file online but has to pay the tax manually still needs to take the time to visit the payment point, having access to both processes online allows the taxpayer to perform the entire tax process via internet at any time of day or night.

6 Regional characteristics and assistance opportunities



Although each digitalisation journey is unique, international organisations and regional tax administration organisations are able to study and map characteristics of specific regions. This insight can be very helpful to tax administrations, as it can provide guidance that can reflect the common challenges that a region may face, offer advice that is more specific to that region, and provide regional networking opportunities. In this chapter, several regional bodies have been invited to give their view on the issues and opportunities of their specific regions, and how they can support the digitalisation journeys of the tax administrations in their regions.

Contact information for the contributing regional tax administration organisations and international organisations is listed below.

Region	Organisation	Contact information
Africa	African Tax Administration Forum (ATAF)	info@ataftax.org
Asia and the Pacific	Asian Development Bank (ADB)	governance@adb.org
Europe	Intra-European Organisation of Tax Administrations (IOTA)	secretariat@iota-tax.org
Latin-America and the Caribbean	Inter-American Center of Tax Administrations (CIAT)	ciat@ciat.org

African Tax Administration Forum (ATAF) viewpoints

In the region technology is fast becoming the backbone of revenue administration and service delivery and thus, the role of central government in supporting the implementation of digitalisation in tax administration and related agencies cannot be over-emphasised. The more African governments embrace the implementation of digital strategies, tax administrations like the rest of other state authorities automatically benefit from infrastructure like the shared internet infrastructure, easy interfacing with other government agencies, Big Data platforms to cross reference and collaborate on data and information that would be would assist in widening the tax base and be admissible in courts of law, to discourage tax non-compliance.

The 2020 African Tax Administration Forum (ATAF) ICT member country survey showed 69.3% respondents acknowledging government political will for digitalisation, while 60.5% respondents attested to government readiness to provide resource to support digitalisation initiatives. Despite the revealed level of readiness, governments have not taken keen efforts to establish and enforce the supporting legal framework which is exposing tax administrations to legal and policy risks.

Many African countries have drafted legislation and policies to promote the monitoring of electronic transactions and subsequently their legal admissibility, but the rate of approving these into enforceable legislation needs improvement in order for tax administrations to enhance the enforcement of tax laws within their respective countries and most importantly to act as a deterrent to large businesses and high net worth individuals from illegal forms of avoidance.

Digital Capabilities

Most African tax administrations have ICT roles within the organisational structure and have hired ICT personnel to build, implement and support the electronic service channels for their respective administrations. Predominantly, administrations have successfully customised of third party software applications, and in some cases built bespoke systems to suit their respective tax systems.

African tax administrations have implemented a wide range of initiatives covering a multitude of tax types and laws, and these projects include **Angola** – SIGT Integrated Tax Management System, **Cape Verde** - Electronic Invoice, **Cote d'Ivoire** - Online Tax Returns Filing and Payment Portal, **Ghana** - Online Payment of Vehicle Income Tax, **Kenya** - Enhanced Payment Gateway (ePG), **Madagascar** - e- HETRA and e-HetraPhone, **Malawi** - Carbon Tax Certificate Application Using Telegram Application, **Malawi** - Document Security, **Mali** - Integrated Tax Management System (SIGTAS), **Morocco** - Modernising the Tax Administration, **Mozambique** - e-Nuit - Citizen's NUICT (Tax) card printing system, **Namibia** - Integrated Tax Administration System (ITAS), **Niger** - Integrated Tax and Taxpayer Monitoring System (SISIC), **Nigeria** - VAT Automation for Banking Sector Success Story, **Nigeria** - FIRS and Corporate Affairs Commission (CAC) integration, **Nigeria** - Reporting Interface and Bank Collection Monitoring Information System, **Rwanda** - Tax Control System and VAT compliance, **Tanzania** - Electronic Filing System (e-filing)

System), **Uganda** - Automated Customs Warehouse and Online Auction, **Uganda** - Streamlining Online Support for Customs Operations, **South Africa** - SARS Transformation into a Data Intelligent Tax Administration, **Zambia** – TaxOnline, COMESA - Digital Free Trade Area – DFTA. Through these projects, administrations are reporting opportunities to reduce their operational costs, processing timelines and chances for corruption and evasion, and improve convenience, service delivery and revenue collection.

However, there is a need to grow and empower the ICT function to deal with the dynamic demands that tax administrations encounter and to adapt to the speed of global technological advancement, particularly in relation to cross border collaboration and Analytics. The heads of ICT and Modernisation projects in African tax administrations have agreed that to respond to these challenges, the focus in the short to medium term should cover:

- Developing APIs and platforms for internal and external system and process integration especially through leveraging public-private partnership system.
- Implementing Big Data Analytics tools for 360 view of taxpayers to enhance compliance monitoring.
- Deepening digital transformation via Service Oriented Architecture (SOA) and DevOps.
- Leveraging private and public cloud infrastructure.
- Leveraging Blockchain technology like e-Invoicing to facilitate capturing tax-related information at source and limit tax evasion.
- Building internal ICT capacity to empower local resources for in-house software development and systems maintenance.
- Developing enterprise architecture framework and ICT strategies to capacitate the ICT function to support the corporate strategic initiatives.
- Modernising ICT infrastructure and extending the diversification of electronic platforms to reach the various demographic needs.
- Increasing the number of automated processes in the tax administration and extend the reach of online and digital services for key clients.
- Focusing and prioritising client needs when developing Client-Centric Services.
- Development of mobile applications to support delivery of RA e-services to taxpayer, to leverages the mobile phone usage and penetration in Africa.
- Enhancement of business continuity measures for RA services.

ATAF's support to member tax administrations

To assist African Revenue Administrations, the Research Department in the ATAF Secretariat has produced a guidebook to improve ICT acquisition, implementation and maintenance. The users of this guidebook will easily understand the dynamics of implementing cost-effective, user-friendly and process efficient ICT tools that the ATAF Secretariat hopes will not only reduce the cost of tax administration but also enhance Africa's collaborative efforts in revenue mobilisation.⁴⁵ Furthermore, ATAF has identified the following areas of focus within African tax administrations to improve digitalisation projects:

- Alignment of key/agreed tax legislation to facilitate the development and sharing of technology infrastructure and systems where applicable.

⁴⁵ The ATAF's *Guidebook on the Efficient Acquisition, Implementation and Maintenance of Integrated Revenue Administration Systems in Africa* was officially launched on 24 June 2021 and can be accessed here: <https://www.ataftax.org/library>.

- Empowerment of the African ICT personnel to deliver on large scale ICT projects in line to international standards corporate governance standards. This may be enabled by utilising cross functional and multi-disciplinary teams and skill which already exist within the continent.
- The registration, declaration and reconciliation processes appear to be more mature in most countries, or at least proven to be an existing capability, thus focus for improvement should be put on Big Data management and Analytics, reporting and cross functional dashboards for the monitoring of financial flows between the African countries.

Asian Development Bank (ADB) viewpoints

Tax administrations' role and functions have been evolving rapidly over the last decade. Many tax administrations start the digitalisation process by automating basic functions like electronic registration and filing. However, more countries, especially in Asia, are moving to the next stage in digital transformation, having implemented both the basic building blocks and processes enabling real-time transaction data to flow into the tax administration. This element in the digital journey, once working, represents a large step towards seamless, continuous data flow which would raise compliance rates and significantly lower compliance and administrative costs. For instance, People's Republic of China has implemented the "golden tax system" which requires vendors to simultaneously stream the underlying details of transactions in order for a VAT invoice to be valid, with the aim to enable highly efficient and automated processing of tax data.

The COVID-19 pandemic has accelerated the adoption and use of digital technology in various ways, reflecting the need to substantially boost revenue administration efficiently and speed, as well as automate basic processes. Yet, digital adaptation and transformation in Asia and the Pacific tax administrations is diverse. Some technologically advanced economies in the region (Australia, Japan, People's Republic of China, Republic of Korea, and Singapore) have already integrated the use of artificial intelligence and predictive technologies and the audit and risk functions. Tax administrations are actively promoting or mandating e-filing in ASEAN (Association of Southeast Asian Nations).

The recent study revealed that, compared to some other regions, East Asia and the Pacific has been able to achieve significantly lower average hours per year for tax compliance⁴⁶. For example, the Australian Taxation Office (ATO) launched "MyTax" to provide comprehensive tax services for individual including lodgement of tax returns, verifying the processing status, and viewing assessments and refund claims.⁴⁷ In addition, pre-filing tax returns has reduced taxpayers' compliance costs to complete tax returns as evidenced by the No-Filing Service scheme in Singapore.⁴⁸

In parallel, many tax authorities within Asia and the Pacific are using digital solutions to improve taxpayer services, including the provision of a single platform or application for taxpayers to manage their tax compliance matters, as well as using machine learning technology to continually understand more about taxpayer behaviours and needs.

⁴⁶ <https://www.pwc.com/gx/en/paying-taxes/pdf/pwc-paying-taxes-2020.pdf>.

⁴⁷ See <https://www.ato.gov.au/Individuals/myTax/>.

⁴⁸ See <https://www.iras.gov.sg/taxes/individual-income-tax/basics-of-individual-income-tax/new-to-tax/your-tax-obligations/individuals-required-to-file-tax>. 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, provident fund) to provide seamless and personalised services for Singapore taxpayers.

In this regard, the Asian Development Bank (ADB) has provided its support for the Philippines to develop a new online registration system. This system intends to supplant the manual process involving visits to the local tax authority office. Once completed, it will be equipped with key functions, allowing the update of taxpayer's registration data via online and real-time access of registration record.

What can ADB do to support tax administrations in the region that consider digitalisation projects?

A large number of fiscal measures to mitigate the impact of COVID-19 and shrinking tax revenues during the pandemic have worsened the fiscal balance and debt sustainability as well as the progress in achieving the Sustainable Development Goals (SDGs). While external finance will continue to play an important role to help fill fiscal gaps, domestic resource mobilisation (DRM) will remain a major strategic priority in the aftermath of COVID-19 for developing countries in this region to address debt sustainability and achieve the SDGs⁴⁹. In this regard, ADB considers DRM as one of five strategic agendas to achieve a lasting and equitable recovery for Asia and the Pacific.

With these challenges in mind, ADB has officially launched the Asia Pacific Tax Hub⁵⁰ as an effective regional hub on DRM and international tax co-operation (ITC) in May 2021. The Tax Hub will assist each ADB developing member country to formulate differentiated DRM and ITC goals, by promoting three foundation blocks: medium-term revenue, roadmaps for digital transformation of tax administrations which facilitates the introduction of digital tools, and proactive participation in international tax initiatives⁵¹. In this context, tax administration reform through digitalisation is a key component to enhancing the capacity and efficiency of tax authorities to handle complex taxpayer activities while providing a sound environment for increased tax morale among taxpayers.⁵²

As one of key foundation blocks under the Tax Hub, ADB has been working closely with the World Bank Group (WBG) on this agenda. A virtual workshop on Tax and Digital Transformation was organised in March 2021 in partnership with WBG, with the aim to assist ADB developing member countries accelerate the digitalisation of their tax functions. The workshop brought together more than 200 participants from nearly 40 economies in this region, and 22 presentations on specific aspects of digital transformation in tax administrations such as data governance and data analytical solutions were delivered by tax practitioners and experts from the public and private sectors and academia. In advance of the workshop, a survey was undertaken to identify what types of challenges tax bodies in this region have been facing. Important findings include that financial resources and public support are the significant gaps when developing a roadmap, and that technical assistance needs centre around data management, development of the roadmap, and impact assessment. Moreover, through a breakout group discussion at the workshop, participants reported the following recurrent needs: data Analytics, data governance, digital

⁴⁹ The Economic and Social Survey of the United Nations Economic and Social Commission for Asia and the Pacific found that developing countries in Asia and the Pacific would need USD 1.5 trillion annually to end extreme poverty and ambitiously move toward universal health coverage, quality education, and infrastructure, while staying on track to limit climate change.

⁵⁰ The Tax Hub is envisioned to serve an open and inclusive platform for strategic policy dialogue, knowledge sharing and development coordination among ADB, its member countries and development partners. See <https://www.adb.org/what-we-do/asia-pacific-tax-hub>

⁵¹ These initiatives include the Inclusive Framework on Base Erosion and Profit Shifting and the Global Forum on Transparency and Exchange of Information for Tax Purposes.

⁵² Stronger collaboration and coordination between the tax policy department and the revenue administration are key to broaden tax base with enhanced tax compliance and greater use of information and communication technology (ICT), to address many of the potential risks of leakages which possibly exist in tax policy structures, and thereby to build confidence in the fiscal contract and trust in government.

transformation strategy and change management, and information security. Against that background, ADB and WBG established and continued to provide in collaboration with VIA University College the Executive Program in Tax and Digital Transformation for the economies in this region.

Furthermore, ADB produced a guidance note which aims to assist ADB developing member countries in embarking on a digitalisation journey. The digitalisation journey will likely start with a deep and wide assessment of the existing baseline, together with the strategic vision and implementation plan. However, while there are common overall objectives and standardised phases, each country transition varies depending on a multitude of factors including the baseline, availability of infrastructure to support digitalisation, and capacity of tax administration. In this regard, this guidance note includes a basic assessment framework which presents the issues and steps required to be taken to set up a roadmap for the digitalisation of tax administration. With this, ADB will provide ADB developing member countries with in-country support by conducting needs assessments, making recommendations based on such assessment, and supporting the implementation of the roadmap.

Inter-American Center of Tax Administrations (CIAT) viewpoints

The recent publication by CIAT "ICT as a Strategic Tool to Leapfrog the Efficiency of Tax Administration" (CIAT, 2020^[6]), contains a set of experiences and practices from different member countries, particularly from Latin America. That material covers different aspects of the digitalisation process, from supporting tax administration core processes, from registration to audit, from arrears collections to dispute resolution or risk management; to ITC specific processes covering issues like security, ICT management, technology platforms and roadmap.

This identifies that tax administrations in the region have used technology to support transaction processing, including returns, payment and refunds processing in an expedite way and to provide taxpayer services, bringing most possible interactions with taxpayers to on-line self-managed applications operated directly by taxpayers.

There are significant differences, however, in the approach and current stage of development of the implemented solutions in different countries. Larger economies with larger tax administrations in South America and Mexico have been incrementally improving their information systems through the years. Smaller economies have implemented tailored made solutions developed by third parties. Many Caribbean countries have adopted COTS packages. Some of these implementations in smaller tax administrations without strong in-house development capabilities have benefited from loans provided by development banks.

In terms of registration some tax administrations have managed to implement fully on-line registration processes, while other tax administrations have a mixed approach where some physical interaction is still required for registration but support on-line interaction for updates.

In terms of tax returns, CIAT has seen electronic filing of returns being widely available and some countries have on-line only channels for tax return filing. Pre-filled tax returns of individual income tax is available in various countries including at least Argentina, Brazil, Barbados, Chile, Colombia, Ecuador, Mexico, and Paraguay. In Brazil, based on the SPED system, Corporate Income Tax Returns of Corporations of the General Regime, do no longer need to file a tax return, since all relevant fiscal and accounting information is already available for the tax administration and final assessment can be determined by the tax administration. On-line withholding certificates have been implemented, for example, in Paraguay, where all certificates are either known or submitted to the tax administration.

One significant development in the region is electronic invoicing systems where all invoices that would imply credits in purchases are at some point, either shortly after the transaction, or even before the transactions are completed, transmitted to the tax administration. More than a dozen countries have solid

and sustainable electronic invoicing systems, including Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Peru and Uruguay, with some countries like the Dominican Republic, Panama and Paraguay starting the roll-out of the system and El Salvador in the pilot project phase.

The benefits of electronic invoicing systems go far beyond the tax administration. Businesses benefit from reduced compliance costs plus the opportunity to improve their business processes thanks to automation and vertical integration.

In 2017 Chile started to prefill VAT returns for all taxpayers in the general regime, having reached a 94 percent acceptance of the proposed returns. Ecuador started to prefill some fields of VAT returns in 2020 and other countries have plans to offer that service to taxpayers.

In addition to direct access to current account details, some countries in the region have successfully adopted an electronic fiscal domicile, that allow a secure digital interaction between the tax administration and the taxpayers, closing the circle that allow the notification of reassessment and other acts without the need of paper or any physical contact.

In terms of control, the use of information technology has been increasingly adopted in risk management processes using business Analytics tools and, more recently in some tax administration, some modest use of artificial intelligence solutions. A centralised approach to risk management, supported in evidence from data, is being adopted not only for audit case selection, but to target specific aspects of compliance like arrears collection and transfer pricing issues and international taxation. A few tax administrations have been already investing in developing artificial intelligence and advanced Analytics solutions that could be incorporated to permanent control processes.

This area of digitalisation is open to a lot of opportunities in the region in the next coming years where application of Big Data, advanced Analytics and artificial intelligence would be used to improve core processes, detect early compliance issues and fraud schemes, improve economic studies and even predict specific behaviours and support interoperability within cooperative compliance programs.

What can CIAT do to support tax administrations in the region that consider digitalisation projects?

CIAT has been supporting tax administrations in the region, particularly the smaller ones, through different technical assistance projects. Some are mid to long term projects focused on a comprehensive improvement of processes, some are targeted projects focused in specific areas of improvement. The latter type of projects has been funded by donors like the German, Norwegian or Swiss cooperation agencies or the EUROsocial program.

Two initiatives that CIAT is conducting that might be worth mentioning are the development of an open-source tool to facilitate the collection of indirect taxes in the digital economy. This solution, called DEC (Digital Economy Compliance) is a parameter-based application that can be used by a tax administration to implement a simplified registration, tax return filing by companies operating in a jurisdiction with no physical presence. Although the solution was developed to support smaller tax administrations from CIAT member countries, the solution can be used by any tax administration in the world.

The second alternative is the creation of a Center for Advanced Analytics and Artificial Intelligence. This centre, that operated over electronic communications channel, focus on the cooperative effort to create good practices, common knowledge and reusable algorithms that can be used by and tax administration of a member country. This programme is focusing in the detection of agents that issue fraudulent invoices that would be used by other taxpayers to claim non-existent VAT credits or justify expenses that would imply a reduction in payable income tax.

Intra-European Organisation of Tax Administrations (IOTA) viewpoints

Tax administration digital capacity in Europe

Compared to other regions in the world, Europe has relatively high capacity when it comes to digital tax administration. However, within the region, there is a fairly broad spectrum of digital capacity in the tax administrations. At one end of the spectrum, there are administrations that have 100% digital capacity and are able to offer all taxpayer services digitally (although they may still provide face-to-face service for taxpayers that are unable/ do not wish to deal with their tax affairs digitally). At the other end of the spectrum, there are administrations that still have many paper transactions and operate mainly on a physical format, but even these administrations have some digital capacity, for instance for electronic registration and filing and some e-Services.

The size of the tax administration, the economic wealth of the country, and the operational capability are, perhaps surprisingly, not good indicators of the digital capacity of the tax administration. There are several countries in Europe that would rank high on the size of the economy and general administrative capability, but would rank relatively low in the region in relation to digital capacity; while other countries would rank low on economy size and general administrative capability, but would rank relatively high on digital capacity. Some of the largest economies in Europe still have regions in the country without internet coverage. The digital capacity of tax administrations is likely to depend more on the extent to which the government is prepared to fund digital transformation. Some lower capacity tax administrations have received financial and/or technical assistance from development partners to develop their digital strategy and build their digital capacity, which has helped to reduce the gap between the high and low-capacity administrations in the region.

Current trends in digital tax administration in Europe relate to the use of technology to improve systems and processes, enhancing the taxpayer's experience of interacting with the tax administration, and streamlining resources (being able to do more with less). The focus is on enhancing e-Services (using IT to make it easier for taxpayers to comply with their tax obligations), developing e-Compliance (making compliance real-time and using technology to identify and audit high-risk taxpayers/transactions) and improving revenue collection through digital tools.

Underlying these developments is the upgrading, in many countries, of their hardware and software. Most tax administrations develop their IT functionality in-house, although one IOTA-member has shared in recent years their positive experience of using Commercial Off the Shelf (COTS) products to deliver e-Services. Having adopted technology many years ago, the current focus is on how to use IT more effectively. Examples of good practice include:

- development of virtual assistance tools and AI chatbots;
- development of digital tax accounts and mobile applications that enable taxpayers to manage their tax affairs, make payments, book appointments at the tax office, etc., online or on their phone;
- using technology, including data Analytics, to make better use of the various sources of data by pre-filing tax returns, apply nudging techniques when taxpayers are using e-filing services, and monitor taxpayer behaviour and response to such methods; and
- using machine learning to predict taxpayer behaviour, encourage taxpayer compliance and enhance risk assessment processes.

Technological advances can create new opportunities and challenges. For example, many tax administrations are exploring how Blockchain can be used in tax services. Best practice in the region includes the development of a Blockchain property transaction verification protocol which enables property transactions to be completed via a mobile app.

The large increase in incoming data, for instance through the introduction of e-Invoicing systems and electronic cash registers, represents opportunities and challenges: The vast volumes of data have necessitated the introduction of data warehouses and the development of systems that can manage storing and analysing such data volumes. As tax administrations develop their capacity in this area, the discussion has shifted more recently from how to collect and manage the data to how to ensure the quality of the data and how to make the most effective use of the data. Some tax administrations have set up dedicated data Analytics teams and recruited specialists such as data scientists, statistical analysts and Big Data experts to develop innovative approaches to manage and exploit the data. These dedicated teams not only improve the effective use of the data, they also speed up the detection of non-compliance and high-risk activities.

How IOTA assists its members with their digital transformation

IOTA assists its members by providing a platform for the sharing of knowledge and experience and the development of best practice in all aspects of tax administration. Members considering digitalisation projects can learn from the experience of other members who have already undertaken similar projects. This is done through the delivery of a range of events (such as forums, workshops, and webinars) and publishing a range of publications (such as books and reports). The events focus on topics that members have identified as being of high priority to them. Members also share news items with the IOTA Secretariat on recent developments in their administrations, which the Secretariat publishes on the IOTA website so that the members can learn about innovative approaches across the region. Members can also request bilateral technical assistance, which is provided by expert(s) from another member country who has already implemented a similar digital tool/programme/initiative. The assistance is demand-driven and the priority areas are determined by the members.

Key digital topics explored at events in recent years include:

- developments in e-services, such as the use of Application Programming Interface (API), "natural" or "transactional" taxation", taxpayer nudging, use of Artificial Intelligence (AI);
- business continuity and delivering e-Services to taxpayers affected by the COVID-19 pandemic;
- the use of social network analysis to fight against tax frauds;
- cryptoassets and Blockchain;
- social network analysis; and
- Big Data Analytics.

A key area of support for IOTA members is through the technical enquiry service. This offers members the opportunity to request and obtain advice directly from other members by using the online service. Members thinking of implementing new policies or processes submit questions via the online function on the IOTA website. The questions are shared with the members, who provide answers which outline what they did when they implemented a similar policy, process, etc. These are some examples of the topics relating to digitalisation that have been enquired about recently:

- Use of data Analytics to identify high risk taxpayer financial transactions
- Data mining
- Pre-filing taxpayer returns
- Digital inclusion
- Revenue management and billing software
- Risk management systems
- Taxation of e-Commerce, registration and filing obligations and monitoring of transactions
- Online tax audits

- Implementation of e-Invoicing
- Electronic transmission of EOI requests
- Taxation of virtual currencies, audit of crypto asset transactions and seizure of crypto assets
- Risk profiling and behavioural Analytics
- Development of Customer Contact Management system
- Online cash registers
- Remote working of tax officials
- Electronic issuance of Tax Residence Certificates

Summarising regional viewpoints

Technology in the regions covered in this chapter have similarities with regard to the external factors influencing the environment in which tax administration operates. When developing solutions based on technology, tax administrations need to be sensitive to the local environment, and to other factors in the local economy, before investing. The linkage between business and economic activities are essential when shaping the tax system.

Common among the tax administrations of the Regional Tax Administrations is that the digitalisation journey started with electronic registration, filing and on-line payments. Amongst the CIAT members a significant development in the region is electronic invoicing systems where all invoices that would imply credits in purchases are at some point, either shortly after the transaction, or even before the transactions are completed, transmitted to the tax administration. In Africa ICT has been pivotal in supporting revenue collection and by allowing self-service via convenient platforms like mobile phones; the ICT systems enable more taxpayers to fulfil their tax obligations, thus improving voluntary compliance. In Asian countries there is a move towards enabling real-time transaction data to flow into the tax administration directly (for example through a cash register function or an online-accounting system which is linked to the tax administration data collection system). Also common for the regions is that the next leap in technology focusses on leveraging the technological opportunities in artificial intelligence, Big Data Analytics and risk management in tax administration.

7 Internationally developed tools, frameworks and offerings



Supporting the digitalisation of tax administrations is a priority for many international organisations, as it can bring about positive changes in the tax administration itself, wider government and the entire society.

Supporting the digitalisation of tax administrations is a priority for many international organisations, as it can bring about positive changes in the tax administration itself, wider government and the entire society. As part of this support, organisations have developed a range of powerful tools, frameworks and offerings to help tax administrations consider and address challenges associated with digitalisation. Using the tools, a tax administration can accelerate the analysis process, uncovering the strengths and weaknesses of their organisation, help identify priority areas for action, identify strategic objectives and execute more successful digitalisation projects.

The currently available range of tools, frameworks and offerings is too large to be covered in this report; instead a representative collection is included in order to illustrate possible utilisation of such opportunities⁵³:

- Tax Administration Diagnostic Assessment Tool (TADAT)
- Medium Term Revenue Strategy (MTRS) development
- Tax DIAMOND
- International Survey on Revenue Administration (ISORA)
- OECD Tax administration maturity models
- Peer-to-peer assistance related to digitalisation

It is important to recognise how these tools, frameworks and offerings can support different stages of a digitalisation journey. For example: an administration may start with a TADAT assessment. Based on the strengths and weaknesses uncovered in the TADAT process and report, the administration formulate and implement a Medium Term Revenue Strategy. As part of the implementation, the administration may use Tax DIAMOND to evaluate strengths and weaknesses related to ICT; use ISORA to benchmark itself against other administrations and identify possible partners for bilateral dialogue; use maturity models in relevant areas to assess current maturity level and describe desired future maturity level; and ask peer administrations for assistance and guidance in specific areas.

Some of these tools and frameworks and several others are mapped in a recently published report from the Norwegian Tax Administration, commissioned by Norad. (Norad, 2020^[31]) The report may offer further ideas about which tool to use under what circumstances.

Tax Administration Diagnostic Assessment Tool (TADAT)

For many administrations, an assessment based on the Tax Administration Diagnostic Assessment Tool (TADAT) may be a good foundation and preparation for the digitalisation journey. The tool, launched in 2015, aims to help the administration assess its strengths and weaknesses as objectively as possible according to a baseline of what the authors perceive to be internationally good practice for tax administration. The tool is developed by a consortium of countries and international organisations; the steering committee includes representatives from the European Union, France, Germany, International Monetary Fund, Japan, Netherlands, Norway, Switzerland, United Kingdom and the World Bank Group. (TADAT Secretariat, 2021^[32])

Although it can be used for self-assessment, it is more commonly used in a formal assessment process performed by trained and certified TADAT Assessors in collaboration with administration staff and managers. Many administrations have already made use of the tool; between November 2013 and February 2020, 90 tax administrations used TADAT for assessments; four of them have done so twice.

TADAT uses 32 high level indicators assessed on a scale from A to D, where A is considered performance on or above the level of internationally accepted good practice and D is considered inadequate performance. The indicators contribute to assessing the following nine performance outcome areas:

1. Integrity of the registered taxpayer base
2. Effective risk management
3. Supporting voluntary compliance
4. On-time filing of declarations

⁵³ See also observations related to Tax gap analysis in Annex A.

5. On-time payment of taxes
6. Accurate reporting in declarations
7. Effective tax dispute resolution
8. Efficient revenue management
9. Accountability and transparency

For each of the nine areas, the assessed value for indicators are based on a range of evidence-based questions, and although none of the areas directly pertain to digitalisation, the indicators and corresponding questions help the administration assess if digitalisation can be part of the solution in weak areas, as exemplified in Box 7.1.

Box 7.1. TADAT: Example of indicator and corresponding evaluation criteria

In performance outcome area 6 **Accurate reporting in declarations**, one of the indicators is *Use of large-scale data-matching systems to detect inaccurate reporting*. This indicator uses the extent of large-scale automated crosschecking to verify information reported in tax declarations to assess the administration's performance in this area.

In order to achieve maximum assessed value for this indicator (an A-score), the administration must show that the following is true:

"There is large-scale automated crosschecking of amounts reported in applicable core taxes declarations with information from all of the following sources:

- (i) VAT declarations.
- (ii) Banks/financial institutions.
- (iii) Employers.
- (iv) Three or more Government agencies (e.g., customs; agencies responsible for government procurement of goods and services; registrar of companies; anti-money laundering regulator responsible for tracking cash transactions; and registrar of immovable property).
- (v) Stock exchanges and/or shareholder registries of listed companies.
- (vi) Social security agency or agencies (for purposes of crosschecking reported employment income).
- (vii) Real estate property registers.
- (viii) Online (internet-based) vendors.
- (ix) Data received from other jurisdictions."

In order to achieve an acceptable assessed value (a C-score), the administration must have the following:

"There is large-scale automated crosschecking of amounts reported in applicable core taxes declarations with information from, at least, VAT declarations, employers, and two Government agencies."

Source: (TADAT Secretariat, 2019^[33]).

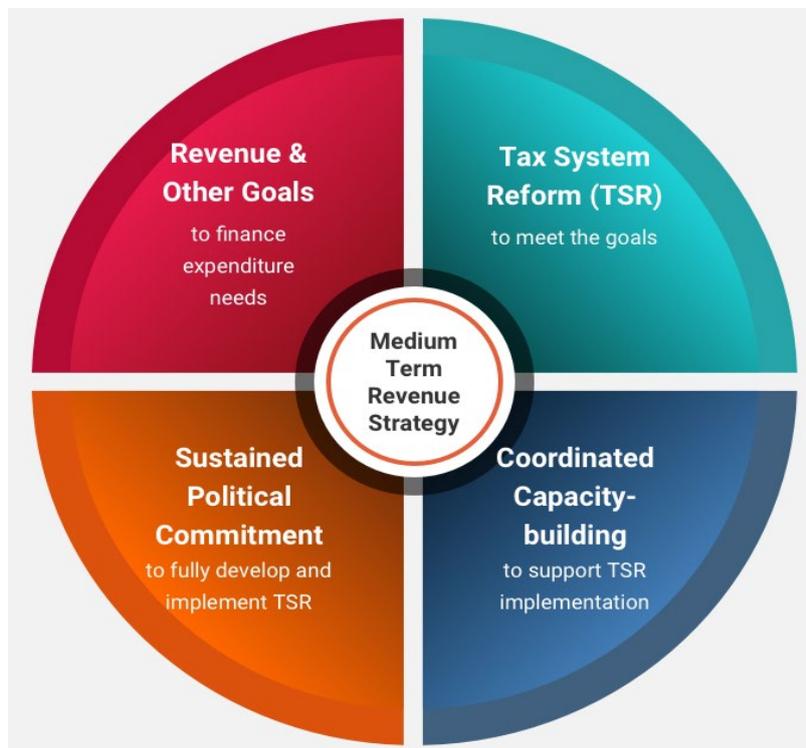
As the name indicates, an assessment based on this tool may give the administration a high-level overview of the current state, not only of ICT-related aspects but also of other important aspects of tax policy and administration. This can contribute to the analysis used in the creation of a digitalisation strategy as suggested in Chapter 3 of the report.

Medium Term Revenue Strategy (MTRS) formulation and implementation

The Medium Term Revenue Strategy (MTRS) concept, launched in 2016, has been developed to assist jurisdictions in their process to create a whole-of-government strategy for tax system reform that aims to increase revenue and improve tax administration efficiency and effectiveness. The emphasis on medium term indicates that it typically covers 4-6 years with sustained implementation of the strategy over time, and the concept covers tax policy as well as tax administration. MTRS is presented by The Platform for Collaboration on Tax (PCT) partners the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the United Nations (UN), and the World Bank Group (WBG), based on an initiative from the G20. (PCT, 2021^[34])

The MTRS concept is based on four interdependent components as illustrated in Figure 7.1., and covers two distinct phases: Formulation of the strategy, and implementing it. In the first stage, the jurisdiction aims to formulate a sustainable, comprehensive evidence- and analysis-based plan covering the four components, while incorporating currently ongoing tax reforms. The second stage, where the strategy is implemented, will include both short- and long-term changes in all four areas.

Figure 7.1. MTRS Interdependent components



Source: <https://www.tax-platform.org/medium-term-revenue-strategy>.

Although the responsibility and the decisions related to the MTRS development rest with the jurisdiction itself, it is common to receive support from PCT partners in the process. The support comes in various forms; for instance, the WBG and the IMF often use their country level presence to support MTRS programs, while the OECD supports MTRS via training, exchange of information, the TIWB programme mentioned earlier and other means. Currently, 25 countries are in the pre-formulation, formulation, early implementation or implementation stage of MTRS.

While there is no direct digitalisation focus to the MTRS approach, its concept note states that the MTRS strategy document should contain a *shift to digital revenue administration*, so jurisdictions following the guidance will need to undergo a digitalisation journey. Furthermore, using the MTRS approach as part of the foundation for the digitalisation journey may offer a range of benefits for the administration. For instance, it can give the jurisdiction and administration a better estimate of revenue over the coming years, allowing for more accurate planning. It can also help in prioritising longer-term goals instead of only focusing on short term wins, and ensure government-level commitment for more complex structures and institutions that can give significant benefit in the long run.

Tax DIAMOND

The World Bank Group has made available the Tax DIAMOND (Development of Implementation and Monitoring Directives for tax reform) for use by tax and customs administrations. This is a set of tools for evaluating strengths and weaknesses of the administration and producing recommendations for improvement. It is often used to prepare technical assistance or lending, can be used either for self-assessment or guided assessment, and focuses on four areas:

- The *core assessment area* is used to evaluate non-technical drivers of policy reform.
- The *business process area* is used to evaluate and offer improvement suggestions for business processes, and offers business process mapping methodology specifically designed for tax and customs administrations.
- The *Information and communication technology assessment area* contains five modules, covering core ICT governance assessment, tax administration automation assessment, customs automation assessment, information security assessment, and infrastructure investment needs.
- The *in-depth assessment area* is currently used for in-depth focused assessments such as HR, Tax Audit, International Tax Unit, Revenue forecasting and tax gap analysis.

For tax administrations considering digitalisation projects, the ICT governance assessment module may be of particular interest: It can guide the administration through collecting information about the current ICT landscape, contrasting the findings to what is considered good practice according to international standards and recommendations by international organisations. The module uses 160 benchmark indicators in 14 dimensions to produce a comprehensive picture of the current ICT status of the administration.

The ICT governance assessment module uses a web application to keep track of the assessment process and results, including assessment meetings, which aids in visualising and documenting the assessment results. Radar and heat maps are used to illustrate the assessment results.

Box 7.2. lists the 14 dimensions used in the ICT government assessment module.

Box 7.2. Tax DIAMOND: Dimensions used in the ICT government assessment module

- *Database Management and Data Integrity*: Measures if the organisation applies standard good practices in the management of databases and if they can ensure data integrity.
- *Disaster Recovery and Business Continuity*: Measures if the organisation applies good practices in disaster recovery to ensure business continuity in case of a major incident.
- *Process Management*: Measures if the organisation manages its ICT projects formally and applying standard good management practices.
- *Security*: Measures if the organisation applies basic security good practices to ensure that the information and technological resources are adequately protected.
- *Quality Management*: Measures whether the ICT department implements basic controls for ensuring the quality of the systems managed and/or developed.
- *Basic Operational Support*: Measures whether the ICT tax systems have basic functions to cover standard needs.
- *Communications Infrastructure*: Measures if the organisation applies standard good practices in the management of the communications infrastructure.
- *Software Engineering Practices*: Measures if the organisation applies basic good software engineering practices to ensure high quality in the development of computer systems.
- *Human Resource Development, Training and Staffing*: Measures if the organisation applies basic good practices in the management of the human resources for the ICT department.
- *Systems Integration, inter-operability and data and information interchange*: Measures if the organisation applies basic good practices regarding systems integration, inter-operability and data and information interchange.
- *Feedback Management*: Measures if the organisation applies standard good practices in obtaining and management feedback from end-users and the organisation.
- *Infrastructure and Hardware*: Measures if the organisation applies basic good practices in the management of the ICT infrastructure.
- *Strategic Thinking*: Measures if the organisation has a medium to long term vision that is actionable and if the organisation uses this vision to guide future developments.
- *Governance and Management Practices*: Measures if the organisation applies standard good practices in the management of the ICT department, the systems and the infrastructure.

Source: (WBG, 2021^[35])

International Survey on Revenue Administration (ISORA)

The International Survey on Revenue Administration (ISORA) aims to collect and present a large set of comparable data concerning revenue administration responsibilities, mandates and results, to facilitate comparison, statistics and trend analysis. It is the result of collaboration between the Inter-American Center of Tax Administrations (CIAT), the International Monetary Fund (IMF), the Intra-European Organisation of Tax Administrations (IOTA) and the OECD. In the last two completed survey rounds as well as the current one, the Asian Development Bank (ADB) also participates. (ADB, CIAT, IMF, IOTA, OECD, 2019^[36]) and (CIAT, IOTA, IMF, OECD, 2021^[37])

The questions used in the survey were originally based on surveys individually conducted by some of the partner organisations; for the first round of ISORA, the combined information needs of the four organisations and their members were merged and common definitions were agreed. Based on evaluations and tax administration feedback from the 2016, 2018 and 2020 rounds of ISORA, the partner organisations have regularly adjusted the questions and definitions.

ISORA is hosted on an ICT platform administered and funded by the IMF; the participating administrations log in through a secure portal and register their information, supported by their corresponding partner organisation. The 2021 collection process (for fiscal year 2020) is underway at the time of writing, and will ask questions from the following areas:

- Introduction: Revenue types or categories for which the administration has responsibility.
- Revenue key figures
- Expenditure, resource key figures and ICT infrastructure
- Human resource information
- Taxpayer segment information
- Operational metrics like number of taxpayers, return filing, payments etc.
- Information related to taxpayer and other stakeholder interactions

Administrations that participate get to compare themselves with other administrations, uncovering where they may have strengths and weaknesses relative to administrations of similar complexity and with comparable responsibilities. Furthermore, administrations can identify those among their peers that are particularly strong where they are weak, and use this as a basis for reaching out bilaterally asking for advice.

Questions directly related to digitalisation are asked in many of the survey areas, as exemplified in Box 7.3., but the questions related to size, complexity and responsibilities are likely to be just as valuable for identifying relevant peers when seeking to benefit from other administrations' experience.

Box 7.3. ISORA 2021: Examples of questions relating to digitalisation

Questions related to compliance

- Does the administration actively use behavioural insight methodologies or techniques?
- Are all or certain categories of taxpayers required to use an electronic invoice mechanism for tax purposes?
- Are certain categories of taxpayers required to use electronic fiscal devices / cash registers?

Questions related to innovation

- Indicate if the administration has implemented and is using any of the following technologies, or is in the process of implementing them for future use:
 - Distributed ledger technology / Blockchain
 - Artificial intelligence (AI), including machine learning
 - Cloud computing
 - Data science / Analytics tools
 - Robotics Process Automation (RPA)
 - Application programming interfaces (APIs)
 - Whole-of-government identification systems
 - Digital authentication technology (e.g. biometrics, such as voice recognition)
 - Virtual assistants (e.g. chatbots)

Source: (CIAT, IOTA, IMF, OECD, 2021^[37]).

OECD Tax administration Maturity Models

Whereas the three tools and methodologies covered earlier are commonly used to get a high-level overview of an administration's strengths and weaknesses, each of the OECD Tax Administration Maturity Models focuses on one particular area. (OECD, 2021^[38])

Maturity models are often used on a self-assessment basis, to help organisations understand their current level of capability in a particular functional, strategic or organisational area. In addition, such models, through the discussion of different levels and descriptors of maturity, may help provide a common understanding across the administration of the type of changes that would be likely to enable it to reach a higher level of maturity over time should it so wish.

The OECD Tax Maturity Models aim

- To allow tax administrations to self-assess through internal discussions as to where they see themselves as regards maturity in the area covered.
- To provide senior leadership of the tax administration with a good oversight of the level of maturity based on input from other stakeholders across the organisation. This can help in deciding strategy and identifying areas for further improvement, including where that needs to be supported by the actions of other parts of the tax administration.
- To allow tax administrations to compare themselves to their peers.

They are generally descriptive rather than prescriptive, focusing on processes and the broad outcomes of those processes rather than metrics. There is also no recommendation within the models as to what is the optimal level for a particular tax administration, since this will depend on individual circumstances, objectives and priorities.

The model area is usually divided into a set of indicative attributes. For each attribute, the administration can evaluate at which maturity level it currently resides, using the rating methodology illustrated in Box 7.4., as well as which maturity level it aims to reach. The middle, Established, level is generally calibrated to match the average level of the 53 FTA member tax administrations.

Box 7.4. OECD Tax administration maturity models: Rating levels

- **Emerging:** Starting level which represents tax administrations that have developed to a certain extent
- **Progressing:** Administrations that undertake reforms in the particular area as part of progressing to the level of advanced tax administrations
- **Established:** Represents where most advanced tax administrations are expected to cluster
- **Leading:** Represents the cutting edge of what is generally possible at the present time
- **Aspirational:** Forward looking at what might be possible as the use of new technology tools develops and new forms of collaboration evolve

Source: Workshop presentation by OECD and the Belgian General Administration of Tax Collection and Debt Recovery, May 2021.

Administrations are encouraged to arrange internal workshops with broad participation where participants are encouraged to express their views when discussing the relevant indicators. This allows for confidential discussions on sensitive issues without rating against other administrations, and provides managers with a good oversight over the level of maturity, as a preparation for measures of improvement. The attributes included in the model are intended to help guide discussions rather than determine them. The self-assessment group will determine which maturity level best matches the administration, based on discussions of the weight it attaches to the importance of the indicators for the area.

Models available at the time of writing include Enterprise Risk Management, Tax Debt Management and Tax Compliance Burden, but the two models expected shortly may be of particular interest to administrations considering digitalisation journeys:

- The Digital Transformation Maturity Model, to be published as part of the FTA project Tax Administration 3.0, will cover six themes, mirroring the building blocks suggested for digital transformation in (OECD, 2020^[8]):
 - Digital Identity
 - Taxpayer Touchpoints
 - Data management and standards
 - Tax rule management and application
 - New skill set
 - Governance frameworks

- The Analytics Maturity Model, developed by the Analytics Community of interest in the FTA together with the FTA Secretariat, is expected to cover two themes:
 - The organisational approach to the use of Analytics
 - Using Analytics effectively in practice
- Both models are expected to be published late 2021 or early 2022. Whereas the first of these coming models can be used in the general context analysis for the digitalisation journey as suggested in chapter 2, the second model may be used to assess where the administration is and should aspire to be in the important yet complex area of using Analytics in tax administrations.

Peer-to-peer assistance related to digitalisation

Tax administrations have a long history of collaboration across a wide range of common challenges, often providing assistance to each other. In the past this has generally focused on technical tax issues such as transfer pricing, investigation and the successful TIWB programme.⁵⁴ Peer-to-peer assistance is currently evolving and moving into the digitalisation space alongside traditional technical tax assistance. For example within the FTA, members have reported 81 ongoing capacity building activities in 2021, where 34 of these offer assistance related to ICT operations and resources including data management and security.⁵⁵

Administrations that have gained experience and expertise in a particular area may be able offer digitalisation assistance in that area. This could for instance include advice on strategy development, strategies, budgetary considerations, ICT architecture options, data Analytics, project delivery and change management.

A number of tax administrations and governments in advanced economies have a team or unit dedicated to organising peer-to-peer assistance. Here are a few examples:

- Estonia has come quite far in developing digital cross-governmental solutions, and offers to provide e-governance architecture to other countries based on their experience in the area. (Estonia, 2020^[39])
- HM Revenue and Customs (HMRC) in the UK has a team dedicated to peer-to-peer assistance and capacity building, that offers assistance across the full range of tax authority functions, including digitalisation.
- In France, within the Directorate general for public finances (DGFIP), the Department for international relations is the unit in charge of capacity building in the tax field. The DIR carries out complementary peer-to-peer programme assistance as well as multilateral programmes in coordination with several donors, and implements numerous missions on a vast range of tax issues - including digital transformation.
- The Norwegian Tax Administration (NTA) has produced a short video explaining how they use IT, which concludes with an offer to assist other administrations in a range of topics related to digitalisation.⁵⁶ The video is part of a broader effort to produce methods and tools on selected topics that are considered beneficial for the NTA and the administrations that they assist.

Although it may be more common to ask for assistance when the choice of digitalisation deliverables have already been determined, interviews conducted for this report show that assistance can also be useful

⁵⁴ <http://www.tiwb.org/>.

⁵⁵ Source: FTA Secretariat.

⁵⁶ <https://vimeo.com/566992194/1787422708>.

during earlier stages. For instance, an administration with experience in using Analytics may be able to offer guidance regarding the scope at introduction, to ensure that the host's goals are realistic and will bring value.

Peer-to-peer assistance comes in a number of forms, from one-off bilateral assistance to long-term and far-reaching assistance programs involving several partners assisting a host. Key features of successful assistance are likely to be that

- the recipient of the assistance takes ownership of the process and the results to be accomplished rather than expecting the partner offering the assistance to initiate the necessary changes;
- the partner or partners offering assistance invest the necessary time to understand the specific context of the administration and the jurisdiction in which it operates;
- if there are several partners offering concurrent assistance to the host administration, the assistance is well coordinated, ensuring that one area of assistance can complement rather than compete with other areas; and that
- previous programmes are used for evaluation and learning.

Administrations seeking peer-to-peer assistance may for instance

- request assistance directly from a specific administration, either directly or via the administration's diplomatic mission or development agency;
- ask for referral to a specific administration via a regional or international organisation;
- ask for advice from one of the organisations regarding who to contact;
- use ISORA data to determine relevant partners for assistance, and contact them as suggested above; or
- ask for assistance from a peer they have engaged with in the past.

When the agreement regarding peer-to-peer assistance is drawn up, the following content may be relevant:

- A description of the scope and focus of the assistance;
- Expected actions by the host and partner;
- Confidentiality and indemnity clauses;
- Expected outcomes;
- The timeline and format of the assistance; and
- Cost coverage agreement.

For longer terms partnerships, the host and partner administrations may develop a joint project plan outlining in more detail the resources, timeline, scope, project milestones, reporting structure, cost allocation, how to measure project outcomes and other necessary arrangements.

The format of the assistance will depend on the content, with high-level decision making assistance and hand-on assistance being two of the common variations:

- For assistance focusing on high-level decision making, the format is likely to be virtual or physical meetings where the partner participants will be senior officials with personal experience of the type of challenges at hand,⁵⁷ and the host participants will be senior managers and senior advisers.
 - Early meetings will focus on background and context information for the assistance request, followed by a discussion of the challenges faced by the host administration. The purpose of

⁵⁷ The host and partner may consider inviting officials from other parts of government, particularly where the digitalisation experience that is being shared has formed part of a wider government strategy.

these meetings will be to ensure that all participants have a shared understanding of the issues to be discussed, and prepare the ground for the jointly developed plan.

- In later meetings, the participants will engage in in-depth discussions on the identified issues to inform decision-making by the host, for example on the adoption of strategic plans, launch of projects, governance and risk management structures, or decisions on procurement options.
- For hands-on assistance, the format in the beginning is likely to be meetings focusing on background and context. Later, if regular interaction is required over time, this might be done through a mixture of virtual and in person engagement.

Definitions

What is digitalisation of a tax administration?

Digitalisation of a tax administration is in its basic form understood to be converting data into digital formats and converting manual processes into processes supported or performed by computers, such as replacing or complementing over-the-counter tax payment with electronic payment solutions.

It can also mean moving from basic to more advanced and efficient forms of digitalisation, such as replacing several disconnected ICT systems with a single integrated and more efficient system, or replacing a partially computer-assisted tax process with an automated process.

Digitalisation can, as demonstrated daily by tax administrations worldwide, contribute to for instance improving taxpayer services, reducing taxpayer burdens, enhancing transparency, improving compliance and increasing revenue.

Analytics: Discovery, interpretation and communication of meaningful patterns in data.

Artificial intelligence: The ability of computers to acquire and apply knowledge, including by performing tasks like sensing, pattern recognition, learning, and decision making. Machine learning is a sub-category of AI.

Big Data Analytics: Performing Analytics on large and complex data sets.

Blockchain: A chain of blocks containing transactions which are linked together in chronological order, using Digital Ledger Technology (DLT). DLT is a form of decentralised database where the ledger is replicated on a large number of computers and all versions are kept identical.

Cloud computing, system or solution: Using computers on the internet to manage and process data.

Cloud storage: Using computers on the internet to store data.

Digital identity: In this report, digital identity includes the set of credentials used to digitally identify a person and the set of attributes also referred to as the digital twin of the person, representing the person in the digital realm, with a subset of the digital identity being used to identify the person.

Internet of things: Physical objects, often with sensory capability, that are connected to the internet and send and receive data.

Nudging: In tax administration context, nudging usually means attempting to influence taxpayer behaviour towards higher compliance through non-intrusive methods like suggesting a particular action, offering additional information or a combination of these.

Platform economy: Sometimes called the sharing and gig economy, this describes the economy related to supplying, sharing, or swapping of services supported by an online platform, for free or for a fee. Common examples based on the platform economy include renting out temporary accommodation and offering rides.

Taxpayer natural systems: These are sometimes called ecosystems; they are the interconnected systems that taxpayers use to run their businesses, undertake transactions and communicate, including for instance business accounting systems, financial service systems, sharing and gig economy platforms.

References

- ADB, CIAT, IMF, IOTA, OECD (2021), *International Survey on Revenue Administration 2020*, [22]
<http://data.rafit.org>.
- ADB, CIAT, IMF, IOTA, OECD (2019), *International Survey on Revenue Administration 2018*, [36]
<http://data.rafit.org>.
- Agile Business Consortium (2016), *Agile Project Framework Contract Template Download*, [54]
https://www.agilebusiness.org/page/Resource_Templates_contract (accessed on 2021).
- Asian Development Bank (2020), *A Comparative Analysis of Tax Administration in Asia and the Pacific: 2020 Edition*, Asian Development Bank, Manila, [103]
<http://dx.doi.org/10.22617/TCS190240>.
- Australian Government Digital Transformation Agency (2016), *Digital Service Standard criteria: Agile and user-centred process*, [53]
<https://www.dta.gov.au/help-and-advice/digital-service-standard/digital-service-standard-criteria/3-agile-and-user-centred-process> (accessed on 2021).
- Bosio, E. and S. Djankov (2020), *How large is public procurement?*, [18]
<https://blogs.worldbank.org/developmenttalk/how-large-public-procurement> (accessed on 2021).
- Bouvet (2021), *Plans are useless but planning is invaluable*, [69]
<https://www.bouvet.no/kurs/kategorier/seminarer/datastrategi-planer-er-ubrukelige-men-planlegging-er-uvurderlig> (accessed on 10 March 2021).
- BrainyMedia Inc (2021), *Wayne Gretzky Quotes*, [80]
https://www.brainyquote.com/quotes/wayne_gretzky_383282 (accessed on 2021).
- Brown, T. (2008), "Design Thinking By Tim Brown", *Harvard Business Review*, Vol. 86/6, [47]
<https://readings.design/PDF/Tim%20Brown,%20Design%20Thinking.pdf> (accessed on 12 March 2021).
- CFPB (2021), *Taxpayer Experience Map*, [41]
https://files.consumerfinance.gov/f/documents/cfpb_taxpayer_map_Final.pdf.
- CIAT (2020), *ICT as a Strategic Tool to Leapfrog the Efficiency of Tax Administrations*, [6]
<https://biblioteca.ciat.org/opac/book/5696>.

- CIAT (2018), *Electronic Invoicing in Latin America: English Summary of the Spanish Document*, [98]
https://www.ciat.org/Biblioteca/Estudios/2018_FE/2018_Electronic_invoice_summary_BID_CIAT.pdf.
- CIAT, IOTA, IMF, OECD (2021), *International Survey on Revenue Administration - Powered by RA-FIT*, [37]
<https://data.rafit.org/?sk=3dba84d7-1dd8-4533-b682-c0dfcb1d7f13&slid=1445908451587>.
- Cotton, M. (2017), *Use of Technology in Tax Administrations 1: Developing an Information Technology Strategic Plan*, [107]
<https://www.elibrary.imf.org/view/journals/005/2017/001/article-A001-en.xml>.
- Cotton, M. (2017), *Use of Technology in Tax Administrations 2 : Core Information Technology Systems in Tax Administrations*, [51]
<https://www.imf.org/en/Publications/TNM/Issues/2017/03/15/Use-of-Technology-in-Tax-Administrations-2-Core-Information-Technology-Systems-in-Tax-44689>.
- Cotton, M. (2017), *Use of Technology in Tax Administrations 3: Implementing a Commercial-Off-The-Shelf (COTS) Tax System*, [52]
<https://www.imf.org/en/Publications/TNM/Issues/2017/03/15/Use-of-Technology-in-Tax-Administrations-3-Implementing-a-Commercial-Off-The-Shelf-COTS-Tax-44719>.
- Crandall, W., E. Gavin and A. Masters (2019), *ISORA 2016 : Understanding Revenue Administration*, International Monetary Fund, Washington, [104]
<http://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2019/03/07/ISORA-2016-Understanding-Revenue-Administration-46337>
 (accessed on 11 June 2021).
- Díaz de Sarralde, S. (2019), *Overview of Tax Administrations: structure; income, resources and personnel; operation and digitalization*. ISORA, Inter-American Center of Tax Administrations (CIAT), Panama City, [105]
<http://www.ciat.org/overview-of-tax-administrations-structure-income-resources-and-personnel-operation-and-digitalization-isora-santiago-diaz-de-sarralde-miguez-spanish-only/?lang=en> (accessed on 11 June 2021).
- Ebert, C., P. Abrahamsson and N. Oza (2012), *Lean software development*, [55]
<http://dx.doi.org/10.1109/MS.2012.116>.
- e-Estonia (2021), *e-tax*, <https://e-estonia.com/solutions/business-and-finance/e-tax/> (accessed on 2021). [93]
- Estonia (2020), *Estonian experience to lead global e-governance cooperation*, [39]
<https://e-estonia.com/estonian-experience-to-lead-global-e-governance-cooperation/> (accessed on 18 February 2021).
- European Commission (2021), *Commission proposes a trusted and secure Digital Identity for all Europeans*, [99]
https://ec.europa.eu/commission/presscorner/detail/en/ip_21_2663.
- European Commission (2003), *Guidelines for successful public-private partnerships*. [68]
- European Parliament (2021), *REVISION OF THE EIDAS REGULATION – EUROPEAN DIGITAL IDENTITY (EUID)*, [24]
<https://www.europarl.europa.eu/legislative-train/theme-a-europe-fit-for-the-digital-age/file-eid> (accessed on 2021).

- Georgia Revenue Service (2019), *2018 Annual Report of the Revenue Service of the Ministry of Finance of Georgia*, http://www.rs.ge/RsGe.Module/GetDoc/Get_File?doc_id=10602 (accessed on 20 July 2021). [10]
- GSMA (2021), *The Mobile Economy Sub-Saharan Africa*, <https://www.gsma.com/mobileeconomy/sub-saharan-africa/>. [11]
- GSMA (2020), *The Mobile economy Sub Sharan Africa 2020*, GSMA, https://www.gsma.com/mobileeconomy/wp-content/uploads/2020/09/GSMA_MobileEconomy2020_SSA_Eng.pdf. [13]
- Hemon, A. et al. (2020), "From Agile to DevOps: Smart Skills and Collaborations", *Information Systems Frontiers*, Vol. 22/4, <http://dx.doi.org/10.1007/s10796-019-09905-1>. [56]
- Hiatt, J. (2006), *ADKAR: A model for change in business, government and our community*. [49]
- HMRC (2021), *Measuring tax gaps*, <https://www.gov.uk/government/statistics/measuring-tax-gaps>. [44]
- Hornstein, H. (2015), "The integration of project management and organizational change management is now a necessity", *International Journal of Project Management*, Vol. 33/2, pp. 291-298, <http://dx.doi.org/10.1016/j.ijproman.2014.08.005>. [65]
- ICAEW (2019), *Digitalisation of tax: International Perspectives.*, <https://www.icaew.com/-/media/corporate/files/technical/information-technology/thought-leadership/digital-tax.ashx>. [29]
- ILO (2018), *Women and Men in the Informal Economy: A Statistical Picture*, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_626831.pdf. [1]
- IMF (2017), *Digital Revolutions in Public Finance*, INTERNATIONAL MONETARY FUND, <http://dx.doi.org/10.5089/9781484315224.071>. [16]
- IMF (2017), *Excerpt: Digital Revolutions in Public Finance*, INTERNATIONAL MONETARY FUND, <http://dx.doi.org/10.5089/9781484323823.073>. [58]
- IMF (2017), *Revenue Administration - GAP Analysis Program*, <https://www.imf.org/~media/Files/News/Seminars/2017/oap-adb-seminar-in-manila-2017/6-imf-adb-tax-seminar-ra-gap-da.ashx?la=en> (accessed on 2021). [43]
- IMF (1998), *The Pay-As-You-Earn Tax on Wages*, <https://www.imf.org/external/pubs/nft/1998/tlaw/eng/ch15.pdf> (accessed on 2021). [85]
- International Telecommunications Union (2020), *Facts and Figures 2020*, <https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/IFF.aspx>. [9]
- IOTA (2018), *IMPACT OF DIGITALISATION ON THE TRANSFORMATION OF TAX ADMINISTRATIONS*, <https://www.iota-tax.org/news/iotas-new-book-impact-digitalisation-transformation-tax-administrations>. [67]
- IRS TAS (2019), *Advocate Releases EITC Special Report, Taxpayer Journey Roadmap*, <https://www.taxpayeradvocate.irs.gov/news/taxnews-advocate-releases-eitc-special-report-taxpayer-journey-roadmap/> (accessed on 2021). [42]

- ITC (2015), *Information Technology in Tax Administration in Developing Countries*, [23]
<https://www.taxcompact.net/resource/information-technology-tax-administration-developing-countries> (accessed on 2021).
- ITU (2019), *New ITU data reveal growing Internet uptake but a widening digital gender divide*, [91]
<https://www.itu.int/en/mediacentre/Pages/2019-PR19.aspx> (accessed on 2021).
- Janowski, T. (2016), *Implementing Sustainable Development Goals with Digital Government – Aspiration-capacity gap*, [70]
<http://dx.doi.org/10.1016/j.giq.2016.12.001>.
- Johnson, C. et al. (2020), *Emerging trends from Africa’s digital platforms*, [96]
<https://cenfri.org/publications/africa-digital-platforms-trends/>.
- Kene-Okafor, T. (2020), *Mobile money service, M-Pesa, is now owned by Vodacom and Safaricom*, [97]
<https://techpoint.africa/2020/04/09/africas-largest-mobile-money-service-m-pesa-is-now-owned-by-vodacom-and-safaricom/>.
- Kenya Revenue Authority (2021), *KRA Mobile Services*, [15]
<https://www.kra.go.ke/en/online-services/m-services>.
- Kenya Revenue Authority (2018), *ICT Strategy 2018-2021*, [76]
<https://kra.go.ke/images/publications/KRA-ICT-STRATEGY-Online-Version.pdf> (accessed on 2021).
- Kitony, G. (2019), *Unlocking Revenue Administration Potential: Case of the Kenya Revenue Authority (KRA) Digital Transformation Journey*. [48]
- KRA (2020), *Leading country examples: Kenya; Digital tax payments*, [84]
<https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/tax-administration-3.0-kenya-country-example.pdf> (accessed on 2021).
- Lee, H. (2016), *Can Electronic Tax Invoicing Improve Tax Compliance?*, [87]
<https://openknowledge.worldbank.org/bitstream/handle/10986/23931/Can0electronic00for0value0added0tax.pdf?sequence=1> (accessed on 2021).
- Lighting Africa (2021), *Our Impact*, [78]
<https://www.lightingafrica.org/about/our-impact/> (accessed on 2021).
- McCulloch, N. (2019), *What Nigerians really think about tax*, [75]
<https://www.ictd.ac/blog/what-nigerians-really-think-about-tax/>.
- Mergel, I., N. Edelman and N. Haug (2019), “Defining digital transformation: Results from expert interviews”, *Government Information Quarterly*, Vol. 36/4, p. 101385, [45]
<http://dx.doi.org/10.1016/j.giq.2019.06.002>.
- Moore, M. (2020), *What is Wrong with African Tax Administration ?*. [57]
- NIST (2020), *Digital Identity Guidelines*, [25]
<https://pages.nist.gov/800-63-3/> (accessed on 2021).
- Norad (2020), *Reforms of Tax Administration and Systems: A Mapping of Current Analytical Tools and Frameworks*, [31]
<https://www.norad.no/en/toolspublications/publications/2020/reforms-of-tax-administration-and-systems-a-mapping-of-current-analytical-tools-and-frameworks/>.

- Norwegian Tax Administration (2017), *Modernisering av Folkeregisteret: Pilotprosjekt i Nasjonalt program for leverandørutvikling*, <https://innovativeanskaffelser.no/wp-content/uploads/2017/03/pilotnotat-skatteetaten.pdf> (accessed on 2021). [40]
- OECD (2021), *Addressing the tax challenges arising from the digitalisation of the economy*, <https://www.oecd.org/tax/beps/brochure-addressing-the-tax-challenges-arising-from-the-digitalisation-of-the-economy-july-2021.pdf>. [95]
- OECD (2021), *Behavioural Insights for Better Tax Administration: A Brief Guide*, <https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/behavioural-insights-for-better-tax-administration-a-brief-guide.htm>. [7]
- OECD (2021), *DAC List of ODA Recipients*, <https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/daclist.htm>. [100]
- OECD (2021), *Methodology for Assessing Procurement Systems*, <http://www.mapsinitiative.org/> (accessed on 2021). [74]
- OECD (2021), *OECD Tax Administration Maturity Model Series*, <https://www.oecd.org/tax/forum-on-tax-administration/about/maturity-model-series.htm>. [38]
- OECD (2021), *Tax Administration 2021: Comparative Information on OECD and other Advanced and Emerging Economies*, <https://www.oecd.org/ctp/tax-administration-23077727.htm>. [20]
- OECD (2021), *Tax administration: Towards sustainable remote working in a post COVID-19 environment*, <https://www.oecd.org/coronavirus/policy-responses/tax-administration-towards-sustainable-remote-working-in-a-post-covid-19-environment-fdc0844d/>. [50]
- OECD (2021), *The Shadow Economy: A Guide to Measurement*, <https://community.oecd.org/docs/DOC-192494>. [89]
- OECD (2020), *Code of Conduct*, <https://www.oecd.org/ctp/exchange-of-tax-information/model-rules-for-reporting-by-platform-operators-with-respect-to-sellers-in-the-sharing-and-gig-economy.htm>. [3]
- OECD (2020), *Digital Government in Chile – Improving Public Service Design and Delivery*, OECD Digital Government Studies, OECD Publishing, Paris, <https://dx.doi.org/10.1787/b94582e8-en>. [66]
- OECD (2020), *Model Rules for Reporting by Platform Operators with respect to Sellers in the Sharing and Gig Economy*, <https://www.oecd.org/ctp/exchange-of-tax-information/model-rules-for-reporting-by-platform-operators-with-respect-to-sellers-in-the-sharing-and-gig-economy.htm>. [2]
- OECD (2020), *Supporting SMEs to Get Tax Right Series: Strategic Planning*, <https://www.oecd.org/fr/ctp/administration/supporting-smes-to-get-tax-right-strategic-planning.htm>. [46]
- OECD (2020), *Tax Administration 3.0: The Digital Transformation of Tax Administration*, <http://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/>. [8]
- OECD (2019), *Digital Government in Chile – A Strategy to Enable Digital Transformation*, OECD Digital Government Studies, OECD Publishing, Paris, <https://dx.doi.org/10.1787/f77157e4-en>. [14]

- OECD (2019), *Digital Government in Chile – Digital Identity*, *OECD Digital Government Studies*, [94]
<https://doi.org/10.1787/9ecba35e-en> (accessed on 2021).
- OECD (2019), *Government at a Glance 2019*, <https://www.oecd.org/gov/government-at-a-glance.htm>. [92]
- OECD (2019), *Implementing Online Cash Registers: Benefits, Considerations and Guidance*, [30]
<https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/implementing-online-cash-registers-benefits-considerations-and-guidance.pdf>
 (accessed on 2021).
- OECD (2019), *Introducing a Commercial Off-The-Shelf Software Solution*, [27]
<https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/introducing-a-commercial-off-the-shelf-software-solution.htm> (accessed on 2021).
- OECD (2019), *OECD Principles on AI*, <https://www.oecd.org/going-digital/ai/principles/> [79]
 (accessed on 2021).
- OECD (2019), *Tax Administration 2019: Comparative Information on OECD and other Advanced and Emerging Economies*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/74d162b6-en>. [64]
- OECD (2019), *Tax Administration 2019: Comparative Information on OECD and other Advanced and Emerging Economies*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/74d162b6-en>. [106]
- OECD (2019), *Tax Morale: What Drives People and Businesses to Pay Tax?*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/f3d8ea10-en>. [61]
- OECD (2019), *The Sharing and Gig Economy: Effective Taxation of Platform Sellers*, [4]
<https://www.oecd.org/ctp/the-sharing-and-gig-economy-effective-taxation-of-platform-sellers-574b61f8-en.htm>.
- OECD (2019), *The Sharing and Gig Economy: Effective Taxation of Platform Sellers*, [101]
<https://doi.org/10.1787/574b61f8-en>.
- OECD (2019), *Unlocking the digital economy - A guide to implementing application programming interfaces in government*, [28]
<https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/unlocking-the-digital-economy-guide-to-implementing-application-programming-interfaces-in-government.pdf>.
- OECD (2019), *Unlocking the Digital Economy - A guide to implementing application programming interfaces in government*, [59]
<https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/unlocking-the-digital-economy-guide-to-implementing-application-programming-interfaces-in-government.htm>.
- OECD (2017), *Shining Light on the Shadow Economy: Opportunities and Threats*, [5]
<https://www.oecd.org/tax/crime/shining-light-on-the-shadow-economy-opportunities-and-threats.pdf> (accessed on 2021).
- OECD (2014), *Increasing Taxpayers' Use of Self-service Channels*, [82]
<https://www.oecd.org/tax/administration/increasing-the-use-of-self-service-channels-by-taxpayers-9789264223288-en.htm> (accessed on 2021).

- OECD (2013), *Electronic Sales Suppression: A Threat to Tax Revenues*, [90]
<https://www.oecd.org/tax/crime/technology-tools-to-tackle-tax-evasion-and-tax-fraud.pdf>
 (accessed on 2021).
- OECD (2012), *Recommendation of the Council on Principles for Public Governance of Public-Private Partnerships*, [71]
<https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0392>
 (accessed on 15 March 2021).
- OECD (2012), *Security and Authentication Issues in the Delivery of Electronic Services to Taxpayers*, [88]
<https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/service/49428035.pdf> (accessed on 2021).
- OECD (2006), *Using Third Party Information Reports to Assist Taxpayers Meet their Return Filing Obligations— Country Experiences With the Use of Pre-populated Personal Tax Returns*, [83]
<https://www.oecd.org/tax/administration/36280368.pdf> (accessed on 2021).
- OECD (2004), *Compliance Risk Management: Managing and Improving Tax Compliance*, [102]
<https://www.oecd.org/tax/administration/33818656.pdf>.
- OECD (Forthcoming), *Digital Transformation Maturity Model*. [73]
- ONS - Energy Meeting Place (2020), *Energy, climate and the driving forces in renewable energy markets*, [62]
<https://www.youtube.com/watch?v=Z7tdGviiia8>.
- Owusu, N. (2014), *Funding E-government projects in Ghana: A case study of the Ghana electronic government (GEGOV) project*, [21]
<http://ugspace.ug.edu.gh/> (accessed on 2020).
- Oxford Reference (2016), *Oxford Essential Quotations*, [72]
<https://www.oxfordreference.com/view/10.1093/acref/9780191826719.001.0001/q-oro-ed4-00004005> (accessed on 25 March 2021).
- PCT (2021), *Medium-Term Revenue Strategy (MTRS)*, [34]
<https://www.tax-platform.org/medium-term-revenue-strategy> (accessed on 2021).
- PCT (2018), “Platform for Collaboration on Tax - Conference Statement 2018”, *Taxation & the sustainable development goals*, [19]
<https://www.oecd.org/tax/platform-for-collaboration-on-tax-conference-statement-2018.pdf> (accessed on 15 March 2021).
- Pillai, R. (2016), *Person-to-Government payments: Lessons from Tanzania’s digitization efforts*, [81]
https://btca-production-site.s3.amazonaws.com/documents/237/english_attachments/Tanzania-Case-Study.pdf?1515010379 (accessed on 2021).
- TADAT Secretariat (2021), *TADAT Overview*, [32]
<https://www.tadat.org/overview> (accessed on 2021).
- TADAT Secretariat (2019), *TADAT Field Guide*, [33]
<https://www.tadat.org/fieldGuide> (accessed on 2021).
- Tomar, L. et al. (2016), “Big Data in the Public Sector. Selected Applications and Lessons Learned”, *Inter-American Development Bank* October. [60]

- Traynor, P. (2015), *Mobile money in developing countries: study reveals security flaws in apps*, [17]
<https://www.theguardian.com/global-development-professionals-network/2015/sep/24/mobile-money-apps-security-flaws-study-reveals> (accessed on 12 February 2021).
- USAID (2017), *Benchmarking the tax system in Liberia*, [77]
<https://www.dai.com/uploads/BENCHMARKING%20THE%20TAX%20SYSTEM%20IN%20LIBERIA%5B2%5D.pdf> (accessed on 2021).
- Vasarhelyi, M. (2018), “How Robotic Process Automation Is Transforming Accounting and Auditing”, *The CPA Journal*, [86]
<https://www.cpajournal.com/2018/07/02/how-robotic-process-automation-is-transforming-accounting-and-auditing/> (accessed on 2021).
- WBG (2021), *Tax DIAMOND*, <https://www.taxdiamond.org/Authentication/Login.aspx> (accessed on 2021). [35]
- WBG (2018), *The Global Findex Database 2017*, <https://globalfindex.worldbank.org/> (accessed on 2021). [12]
- World Bank Group (2017), *Technical standards for Digital Identity: Draft for discussion*, [26]
<https://thedocs.worldbank.org/en/doc/579151515518705630-0190022018/original/ID4DTechnicalStandardsforDigitalIdentity.pdf>.
- World Bank Group (2015), *World Development Report 2016: Digital Dividends*, Washington, DC: World Bank, <http://dx.doi.org/10.1596/978-1-4648-0671-1>. [63]

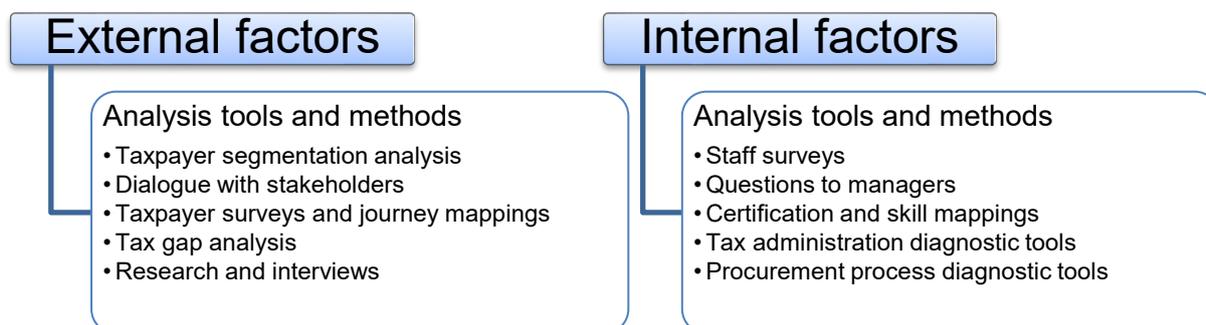
Annex A. Observations on the context analysis process



Tax administration feedback provided for this report suggests that context analysis is usually the first step of a digitalisation journey, as it offers insight into the external opportunities and challenges that can be addressed by digitalisation and the internal capabilities and constraints of the tax administration preparing for the journey. Based on the experience of tax administrations around the globe, this annex augments Chapter 2, by offering observations, learning and advice to the team performing the context analysis.

Administrations can use the observations in this Annex, summarised in Figure A.1., as reminders for good practices, while adapting them to local conditions and complementing them with their own experiences, in order to achieve a context analysis of consistently high quality.

Figure A.1. Summary of common tools and methods for analysis



Common tools and methods for analysing external factors

Taxpayer segmentation analysis

If the tax administration has not done this already, it is highly recommended to perform a taxpayer segmentation analysis during the analysis stage, and if a segmentation model exists it may need to be updated to reflect the current situation in the jurisdiction. An updated taxpayer segmentation analysis may be used for many purposes; for instance, some tax administrations organise their work around the segments uncovered by the analysis, and the segmentation activity may uncover significant compliance risks. Therefore, careful and regular taxpayer segmentation may be beneficial far beyond the digitalisation journey. This report only gives a short introduction to taxpayer segmentation analysis; administrations may seek further guidance from online sources or peer administrations in this context.⁵⁸

The segmentation model could for instance use the following categories:

1. Individuals and businesses in the informal economy with potential for becoming taxpayers⁵⁹
2. Regular personal taxpayers
3. Tax agents
4. Small and medium enterprises (SMEs)
5. High net wealth individuals (HNWI)
6. Large enterprises
7. Multinational enterprises (MNEs)
8. Government entities (where relevant)

Taxpayers are often segmented according to known legal facts about size and financial parameters, but known information about behavioural risk factors can also be used for this purpose. Ideally, all taxpayers within a segment should demonstrate similar responses to tax administration services and treatment, but this may not be possible. For example, taxpayers may have different access to IT- or professional advice and have different levels of understanding and experience with fulfilling tax obligations.

⁵⁸ See for instance <https://www.gov.uk/government/publications/hmrc-annual-report-and-accounts-2019-to-2020/hmracs-customer-segmentation>.

⁵⁹When considering the composition of the group not formally paying taxes, many developing country tax administrations also need to consider that this group may be paying a range of informal tax-like fees to local communities and organisations in order to get an accurate picture of the tax situation.

When performing the analysis, it is common to record the approximate size, characteristics and composition of each segment, as well as other information that may be useful for developing communication plans and change management plans for the segment.

Dialogue with stakeholders

Engaging in direct dialogue with relevant stakeholder groups can be very fruitful when seeking information regarding external factors. This section offers some suggestions for groups to consider.

Representative groups: Some taxpayer groups may be represented by national or regional organisations which can provide valuable information about challenges and opportunities to be addressed through digitalisation. Examples of representative bodies include business associations, civil society organisations, trade unions and taxpayer associations. These bodies may assist in the analysis by providing their understanding of compliance issues and taxpayer burdens, and provide ideas for digitalisation. The example in Box 7.5. shows the vision of one taxpayer association, illustrating how taxpayer groups and tax administrations may share common goals, making it particularly worthwhile to discuss opportunities and challenges.

Box 7.5. The vision, mission and values of the National Taxpayers Association in Kenya

VISION

A taxpayer responsive government delivering quality services to all

MISSION

To advocate for government accountability in the delivery of services and to influence policy through engagements, partnerships and tax-payer transforming information and research

VALUES

Integrity, Respect, Inclusivity, Passion, Innovation/Innovativeness”

Source: <https://www.nta.or.ke/our-history/>.

Other governmental entities: Later in the digitalisation process, it will probably be necessary to establish formal agreements with all governmental entities with which the tax administration will exchange data. At the context analysis stage, it is probably more appropriate to focus on open and constructive dialogue. Together with the external partners, the administration can explore shared challenges and opportunities to prepare for potential tax administration digitalisation based on data from other government sources, delivering tax system-generated data to other government units as well as collaborating on potential whole-of-government programs.

It is generally recommended to commence the dialogue on a relatively high managerial level to ensure goodwill from and constructive working relationships with the other government units. The tax administration may also seek dialogue with managers and staff on other levels in the organisation with knowledge of the areas explored for potential collaboration, to uncover important information about details that may not be known on higher managerial level. For example, in one case noted by a contributor to this report, the tax administration had been informed by management in the unit responsible for the property register that property information was electronically available and thus ready for use for digitalised property

taxation. However, when the project started it turned out that the information consisted of scanned documents, not a structured database. This significantly increased the cost and complexity of the property taxation project.

Private sector: In addition to consulting representative bodies, the administration will most likely benefit from seeking direct and early dialogue with sector stakeholders that may impact the success of tax administration digitalisation. This includes but is not limited to financial software vendors, large corporations with in-house software development and financial institutions that may be expected to provide data for prefilling or checking tax returns. Tax administrations may wish to consider initiating the dialogue with meetings that are open to the public, and continue with invitation-based meetings for particular groups or individual enterprises. The example in Box 7.6. shows how early stakeholder dialogue can be planned.

Box 7.6. Norway: Initiating early dialogue with digitalisation project stakeholders

In preparation for developing a modernised Peoples' registry (a digital registry) in the period 2014-2018, the Norwegian Tax Administration invited stakeholders to a "Dialogue Conference" in 2014. The purpose of the conference was to establish the stakeholder dialogue at an early stage in the project, present the project scope and plans, and invite the stakeholders to share their reactions and opinions.

Following up the conference, the NTA also invited stakeholders to register for one-on-one dialogue meetings with the project team.

Source: (Norwegian Tax Administration, 2017^[40]) (reference only available in Norwegian).

Taxpayer surveys and journey mappings

For some areas considered for digitalisation, surveys may be a useful source of information for understanding the external conditions. For instance, a tax administration considering the introduction of electronic registration, filing and payment could benefit from responses to survey questions covering the current digitalisation level of the targeted taxpayer groups. In ISORA 2018, 108 of 159 respondents (almost 68%) reported for fiscal year 2017 that they had conducted taxpayer satisfaction surveys. (ADB, CIAT, IMF, IOTA, OECD, 2019^[36]) Existing surveys can be expanded with questions related to digitalisation, and administrations that currently do not perform taxpayer satisfaction surveys can get started on this arguably important taxpayer satisfaction assessment process by linking it to the digitalisation journey.

Some administrations find it useful to commission an external company to perform the survey, as this may lead to taxpayers giving more candid answers. Regardless, the group composing and executing the survey should be staffed with particular expertise in social research and analytical capability to interpret the results correctly, in addition to an adequate understanding of taxation.

In cases where it is necessary to gain an in-depth understanding of the current challenges of particular taxpayer groups, mapping the groups' taxpayer journeys (i.e. the different steps involved in fulfilling tax obligations) could be worth the effort. The likely method of preparing the maps is through interviews with representative taxpayers or taxpayer organisations, and can be performed as a one-off exercise or on a regular basis. Taxpayer organisations may also have produced useful maps themselves. The following examples of mappings can provide ideas and inspiration: The Consumer Financial Protection Bureau in the USA has developed a publicly available form which tax officials can use to produce taxpayer journey maps (CFPB, 2021^[41]); and the IRS Taxpayer Advocate Service has produced a Taxpayer Roadmap which illustrates the journey for taxpayers in the USA. (IRS TAS, 2019^[42])

Tax gap analysis

Tax gap analysis is a common methodology for analysing noncompliance. The analysis can be performed by the administration itself or in collaboration with a neutral third party like RA-GAP mentioned below. This report only offers a short introduction to the topic; administrations lacking experience with tax gap analysis are encouraged to seek further information and assistance from peer administrations or international organisations.⁶⁰

Tax gaps can, in addition to providing useful information about the current state of revenue collection, contribute in other areas. For instance, publishing tax gap information contributes to transparency which is likely to increase trust; the information uncovered in the analysis can be used alongside taxpayer segmentation information to inform wider tax administration strategy; and repeated tax gap analyses during a digitalisation journey may show that the tax gap is being reduced thanks to digitalisation.

The two common approaches among tax administrations are:

- Bottom-up, where existing information on illegal activity is used to try to extrapolate the size of the problem to population level; and/ or
- Top-down, where the size of the problem is estimated based on available aggregated data.

The advantages of the bottom-up approaches, assuming that it incorporates random audits, include opportunities for stratification (breaking down the problem by region, sector or industry) and more accurate measures. The obvious disadvantage is the high cost, both for the tax administration and audited taxpayers.

Top-down approaches on the other hand are relatively inexpensive, and the results can usually be used for cross-jurisdiction comparisons as well as time series; while they often suffer from the lack of stratification, significant dependency on third-party information and sensitivity to change in national accounting standards, and still require highly skilled staff for analysis and interpretation of results.

As a source of further information and possible assistance, the IMF offers a tool for tax gap analysis, RA-GAP, which for some variants also includes training. (IMF, 2017^[43]) In addition, HM Revenue and Customs (HMRC) in the UK publishes a comprehensive methodology for tax gap analysis along with the analysis. (HMRC, 2021^[44])

Research and interviews

Some external information that the administration deems necessary in preparing the digitalisation strategy may not be available through any of the activities described above; there may be need for further research, for instance on the internet, to complement the knowledge base. Possible areas of research include but are not limited to studying academic research results on technology adoption, the informal economy and financial outflow as well as studying political platforms in relation to support for government digitalisation.

Interviews with financial services providers can also be helpful in understanding the future landscape and any barriers to the service, such as transaction costs.

⁶⁰ FTA members may also consider seeking guidance from peers via the Shadow Economy Community of Interest.

Common tools and methods for analysing internal factors

Staff surveys

It is fairly common for tax administrations to perform annual staff surveys: According to ISORA 2018, 91 of 158 responding tax administrations (57.5%) performed staff surveys in 2017. (ADB, CIAT, IMF, IOTA, OECD, 2019^[36]) Such surveys can be expanded with questions related to digitalisation issues. Administrations that currently do not perform staff surveys can get started on this arguably important internal assessment process by linking it to the digitalisation journey, and ensure that questions related to digitalisation issues are included.

Questions to managers

Middle managers are likely to know their departments' strengths and weaknesses well, and can assist by responding to questions in this regard. A different set of questions should probably be sent to each department head in order to analyse the administration's current ability to execute digitalisation projects, for example:

- the legal department can be consulted for internal legal aspects;
- the HR department for opportunities and challenges related to the staff responsibilities and wellbeing;
- the ICT department for topics related to ICT infrastructure; and
- each tax function department for digitalisation needs and issues related to that function.

If change managers belong to a single department, that department head is probably the best person to answer questions related to that skill; correspondingly for project management. Otherwise, all department heads should be asked about the existence of such skills, skills gaps and the adequacy of training programmes.

It is recommended to consult all department heads with regard to known ICT issues and their assessment of the department management and staff's change culture - the ability and willingness to change.

The managers should be encouraged to answer as accurately and honestly as possible, with promises that revealing challenges in their unit will not lead to repercussions, to ensure that this round of questioning uncovers any issues that may hamper or derail digitalisation projects.

Certifications and skills mapping

Ideally, information regarding tax officials' up-to-date programme and project management, change management and ICT-related skills is stored in the administration's human resource management system. If not, the mapping has to be performed manually by relevant unit managers and their assistants, and the administration may consider if the information obtained can be stored and subsequently updated in the HR system.

The skills mapping process can record the type of skill (for instance basic office software skills, tax function software skills or Analytics software skills), an indication of skill level (for instance from rudimentary to advanced), and the number of staff per unit with this type of skill on this level. What unit level on which to perform the mapping will vary widely between administrations, with the smallest ones possibly seeing the entire administration as a unit.

If the administration has an in-house ICT department, the mapping can also include a specific set of skills for this department. Similarly, administrations with Analytics solutions can include a mapping of such skills.

For large tax administrations it may be appropriate to group staff according to the mapping parameters, counting how many there are with each set of skills, to avoid too large sets of data. For smaller administrations, the mapping will likely happen person by person.

The programme and project management skills mapping should ideally include certifications as well as experience:

- Many globally approved **certifications** can be independently verified, such as certifications from the Project Management Institute⁶¹, the Agile Business Consortium⁶² or Axelos⁶³.
- The **experience** mapping may include project size and complexity as well as project field, if possible with verifiable experience from ICT- and tax-related projects highlighted.

Procurement process diagnostic tools

Although there may be other relevant procurement process diagnostic tools available, this report highlights the [Methodology for Assessing Procurement Systems](#) (MAPS), developed by a consortium of national and international organisations. By showing what works and what does not, MAPS can support efficient reforms to improve public procurement systems. Using MAPS also provides a roadmap for achieving these goals, and tax administrations can turn to the MAPS-secretariat for support in this regard, as outlined in Box 7.7.

Box 7.7. Methodology for Assessing Procurement Systems (MAPS) support

The MAPS Secretariat housed at the OECD's Public Governance Directorate oversees the development and use of MAPS. The mission of the Secretariat is:

- Promoting the MAPS Initiative and its tools globally
- Ensuring quality control and certification of assessment and assessors
- Conducting studies, gathering data and distilling knowledge on MAPS usage and impact
- Maintaining and improving the methodology
- Training assessors and officials on the methodology

The Secretariat provides support for all kinds of stakeholders, including:

- Advice to country teams for planning and management of assessments
- Quality review of central deliverables in assessments
- Advice to assessment teams on the methodology
- Facilitate collaboration and partnerships with a view to conducting assessments

Source: www.mapsinitiative.org.

⁶¹ <https://www.pmi.org/>.

⁶² <https://www.agilebusiness.org/>.

⁶³ <https://www.axelos.com/best-practice-solutions/prince2>.

Annex B. Observations on the digitalisation strategy process



The second stage of a digitalisation journey usually entails creating a digitalisation strategy which can signpost the direction and pace of digitalisation in the administration. Continuing from Chapter 3, this annex covers some key observations on what makes an effective strategy development process.⁶⁴ The observations are based on research and feedback from tax administrations, and cover how to draft, refine and approve the digitalisation strategy. It also covers some key learning on how the cost-benefit analysis, risk analysis and gap analysis can be used to improve the content, quality and sustainability of the strategy.

⁶⁴ The following IMF-report offers advice and examples related to producing an Information Technology Strategic Plan: (Cotton, 2017_[107]).

When creating the digitalisation strategy, tax administrations have found that the following stages are commonly included, although local conditions may require additional stages – or some stages being omitted:

1. Draft objectives;
2. Perform a gap analysis;
3. Draft deliverables;
4. Perform a cost-benefit analysis;
5. Estimate deliverables;
6. Draft remaining elements;
7. Consult stakeholders;
8. Revise the strategy; and
9. Seek approval for the strategy.

It is often necessary to revert to earlier stages several times during the process, in order to incrementally improve the strategy quality before approval.

Drafting the objectives

Drafting the objectives is usually the first step of creating the digitalisation strategy, since the objectives constitute the foundation of the strategy. The strategy team can do this drawing on the feedback received during the analysis phase. It is worth emphasising that the objectives at this stage are to be considered early drafts, to be adjusted continuously as new information comes to light, until the strategy is ready for approval.

Some administrations find it beneficial to classify the objectives in order to maintain more rigorous control of the results. A study on digital transformation in governments suggests that the objectives can be grouped into outputs, outcomes and impacts, using the following definitions:

- Outputs: “Any quantitative results that can be counted” – for instance percent increased revenue over a specific time period for a tax type and taxpayer segment;
- Outcomes: “the effect of an action, the consequences of an implementation or change” – for instance reduced compliance burden for taxpayers as evidenced by taxpayer satisfaction survey results;
- Impacts: “having a longer-term effect than measurable outputs or more immediately distinguishable outcomes” – for instance the positive impact of digitalisation on value creation.

This form of classification would make it easier to evaluate which objectives are quantitatively measurable and can be followed up with Key Performance Indicators, which objectives are qualitatively measurable, and which objectives may not be measurable or may only be measurable in the long term. (Mergel, Edelmann and Haug, 2019^[45]) Thus, investing the necessary time in defining and structuring the objectives will lay the groundwork necessary to later assess whether the goals of digitalisation are being reached.

Performing a gap analysis

Based on the analysis phase, drafted objectives and other available information, the team may perform a gap analysis to determine the difference between the level of digitalisation the administration wants to

achieve by the end of the digitalisation journey as described by the objectives, and the current level as uncovered in the analysis phase.

Administrations might find the forthcoming OECD Maturity Model on Digital Transformation to be a useful tool for the gap analysis.⁶⁵ By comparing the assessed current maturity with the desired maturity level as described by the objectives, the administration can determine the gap between as-is and to-be of digitalisation.

Box 7.8. What are maturity models?

Maturity models are a relatively common tool, often used on a self-assessment basis, to help an organisation understand its current level of capability in a particular functional, strategic or organisational area as well as the type of changes that would be likely to enable the organisation to reach a higher level of maturity over time. Maturity models work by setting out broad-brush descriptions of capabilities and performance across a number of levels of increasing maturity.

Maturity models are generally descriptive in nature, with a focus on processes and the broad outcomes of those processes, rather than being heavily based on metrics. This recognises that even where the metrics chosen may indicate a good or less good outcome, they do not by themselves show how that outcome has been achieved, and the sustainability of the outcome or its robustness and adaptability to changes in the external environment. By their nature, maturity models are not prescriptive as to the details of processes nor as to how broad outcomes should be achieved. There is no one-size-fits-all nor any detailed method that should be preferred to another in all circumstances.

Source: FTA Secretariat.

Drafting digitalisation deliverables

Subsequently, the strategy team can draft a set of digitalisation deliverables to cover the gap. Whether deliverables are described as suggested below or according to the administration's own template, it should be clearly stated how each deliverable contributes to fulfilling one or more of the strategy objectives. Chapter 5 lists frequently digitalised areas and deliverables.

It is common for the description of each deliverable to include associated costs, benefits, prerequisites and assumptions, where the first two will be further developed through the cost-benefit analysis:

- The **cost** breakdown should consider technical as well as human resource aspects; a list of typical costs associated with tax administration digitalisation projects is provided below.
- **Benefits** may be expected internally, externally or both. For instance, an administration may, based on the objective of reducing taxpayer burden, decide to develop a chatbot for digital taxpayer service. From this deliverable, the taxpayer may be able to access simplified assistance in a more convenient manner, including 24/7 in some cases. For its part, the tax administration staff can expect a significant reduction in repetitive tasks related to taxpayer assistance.
- **Prerequisites** may for instance include other deliverables having been completed first or legal changes that need to be in place before roll-out.

⁶⁵ For more information on this, see Chapter 7 and Box 7.8.

- **Assumptions** could for instance relate to digitalisation projects executing in parallel in other governmental entities.

Sometimes it may also be necessary to consider and include the cost of *not* producing the deliverable, in order to properly appreciate its benefits.

Performing a cost-benefit analysis

In order to be able to more accurately describe the budget needed for digitalisation as well as the expected benefits, a cost-benefit analysis is needed for every deliverable. For the analysis, it is usually necessary to involve expertise apart from technology and tax; such analyses are often a core part of economists' daily work, and seeking assistance from experienced evaluation practitioners may be necessary to ensure that best practice is followed, for instance that benefits are described alongside methods to evaluate them.

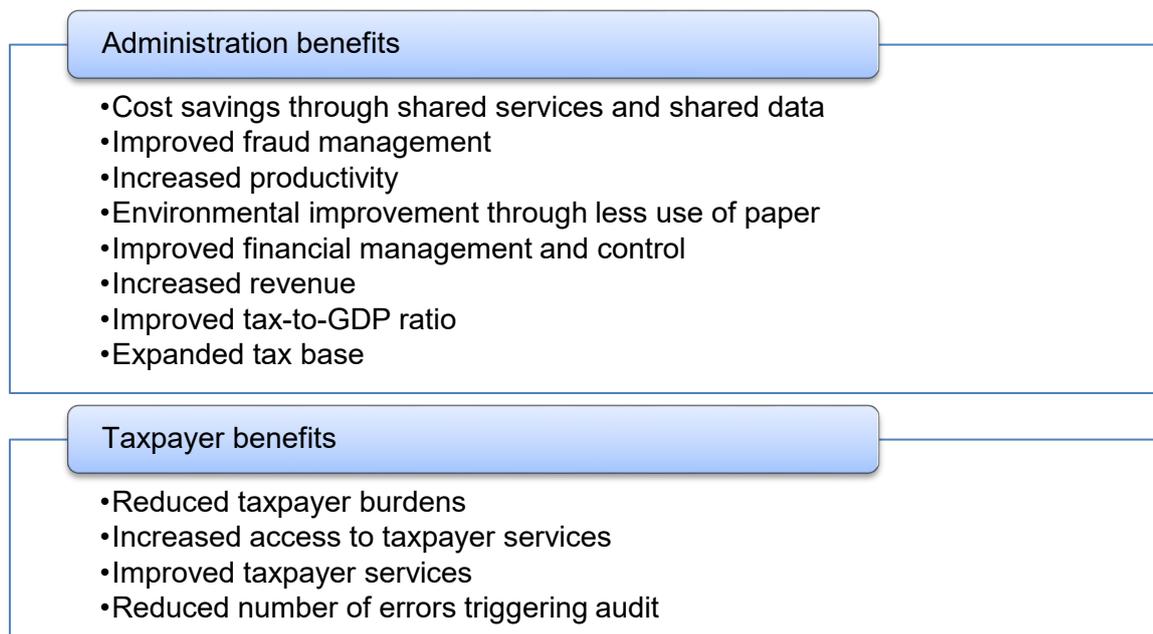
Examples of possible benefits from digitalisation are listed in the figure below. The benefits should be clearly described and as much as possible quantified, but not overstated. It is important not to only consider direct financial benefits. For instance, digitalisation may improve the transparency of the administration; this may in turn improve tax morale, which will improve compliance and thereby increase revenue, but the amount of increased revenue may be difficult to assess due to the indirect effect of the benefit.

Likewise, the cost side of the analysis needs to include both financial costs and other costs. It is common to gather the financial cost estimates and benefit estimates in a single table per deliverable, for instance to show how long time it would take for increased revenue from the deliverable to cover the cost of implementing it.

Typical challenges encountered when performing the cost-benefit analysis can be:

1. *Estimating the cost* of completing the proposed deliverable. One possible approach is to contact administrations that have completed similar digitalisation projects and ask for experience data. The contributing documentation that has been supplied by tax administrations for this report, available on the report web site, may be a good place to start looking for administrations with relevant experience. The regional tax administration organisation may also be able to offer suggestions on who to contact, and analysis of ISORA data may also indicate where to start. Contact information for regional organisations and further discussion on ISORA is available in Chapter 7.
2. Describing *measurable benefits*, to ensure that the stakeholders remain confident that the project will be worth supporting. To achieve this, the administration may find it useful to follow the SMART principles when describing the digitalisation deliverables: They should be specific, measurable, achievable, realistic and timely. (OECD, 2020^[46])

Figure 7.2. Examples of possible benefits from digitalisation



Performing risk analysis

Each deliverable and the digitalisation journey as a whole may be subjected to risk analysis. While possible risks are highly dependent on local circumstances, the following risks exemplify what to consider during the strategy development:

- Digital capability may be abused by being used for the wrong purpose, if for instance tax officials use access to taxpayer data for personal gain. This will most likely have a detrimental effect on tax morale, and may possibly be counteracted with rigid access governance.
- Lack of parliamentary support for the digitalisation process may cause financial backing to dwindle with time. To avoid this, the strategy team could when possible include digitalisation deliverables which are likely to give taxpayer benefits and therefore resonate with lawmakers.

This topic is revisited in Annex C which focuses on project management guidance.

Performing estimation and drafting remaining parts

Financial aspects of the strategy rightfully get significant attention due to their importance, and the strategy team needs to strike the balance between giving estimates without sufficient backing and not supplying clear enough estimates to make decisions. The following list, though far from exhaustive, suggests areas for which there commonly is need for funding in digitalisation projects:

- Core tax ICT systems: Development or procurement; maintenance or rent/ leasing; support.
- Supporting tax ICT systems like Analytics services: Same components as above.
- Business ICT systems like HR, knowledge and accounting software: Same components as above.

- Infrastructure and networks: Same components as above.
- Digital service channels like chat solutions and online guides: Same components as above.
- Business process reengineering consultancy.
- Organisational change management consultancy.
- Project organisation: Project management staff, change management staff.
- Staff cost: When line staff are temporarily allocated to project work, they need to be replaced, and this cost is commonly covered by the project budget.
- Training cost: This includes both internal training (for the administration) and external training (for tax intermediaries and taxpayers).
- Communication cost: Depending on the jurisdiction's infrastructure, the administration may use for instance text messages, newspaper advertising, radio advertising or TV advertising or a combination of these in order to inform taxpayers about the coming changes and motivate them to use the new opportunities.

Some tax administrations have made the mistake of focusing funding needs on procuring the new system, and not including funding for other expenses like migration from existing systems, rollout and maintenance of the new system and training. There are examples of ICT systems for tax administrations that have remained unused for several years after installation because the secured donor funding included only acquisition, not rollout and support.⁶⁶

Another mistake to avoid relates to what type of budget is going to be needed, and depends largely on the choice of core ICT solution architecture: Whereas administrations that build their own IT systems and administrations that buy ready-made systems need a large investment budget, administrations that rent IT systems are likely to need a large operations budget.⁶⁷ The administration needs to ensure that the financing is available in the appropriate budget.

On the basis of the draft deliverables, the cost-benefit analysis, the risk analysis, and the estimation, the team should be able to estimate the project parameters for each deliverable: scope, time, resources, quality and risk. This can be added to the drafted strategy.

At this stage there also should be sufficient information to draft the remaining parts of the strategy, which may include the prioritisation and timeline of the deliverables, plans for human resource management, financial aspects, governance arrangements and other elements as deemed necessary by local conditions.

Performing stakeholder consultations

The draft strategy can be used as a basis for stakeholder consultation. By using a relatively complete draft for the consultation process, those being asked for comments have something specific on which to comment, while clearly defining it as a draft ensures that they understand that there is room for change based on feedback.

Reusing connections established during the analysis process if appropriate, the administration is advised to consult relevant taxpayer groups, representative bodies, relevant government units and relevant private sector representatives externally; and managers and staff internally.

It is common to invite the stakeholders to comment on for instance choice of objectives, which deliverables of digitalisation to include in the strategy, the prioritisation of the deliverables, and the expected benefits

⁶⁶ Source: Meetings with tax administration officials between January and June 2021.

⁶⁷ For a longer discussion on the common choices of core ICT solution architectures, see Annex D.

from digitalisation. Which other elements to include in the consultations depending on the stakeholder group.

While the initial round of stakeholder consultations is likely to give immediate benefits to the quality of the strategy, sustainable positive effects may depend on regular consultations throughout the digitalisation journey, to ensure that opportunities and challenges related to changing circumstances are duly considered. For instance, if a withholding regime is introduced, a group of representative organisations can be assembled to give feedback on the draft strategy, and the same group can be invited to regular consultations until the solution has been rolled out.

Draft revision and approval

The feedback received from internal and external stakeholders can be used to revise the strategy. The team may also choose to revert to earlier stages of the drafting process, like the gap analysis or the risk analysis, for revision. Consequently, there may be need for more than one round of stakeholder consultation.

When the strategy team is confident that the draft presents a good description of the administration's strategic approach to digitalisation, it can be subjected to the approval process. The time of approval will usually be a good time for press releases and press interviews, in order to maximise the anticipated wave of goodwill related to the start of the digitalisation journey.

Annex C. Observations on managing successful digitalisation projects



Based on the approved digitalisation strategy, the administration can plan and execute one or more projects to deliver the results anticipated in the strategy. This Annex supplements Chapter 4 by offering specific observations and learning related to managing digitalisation projects. These come from examining a wide range of digitalisation projects, and are primarily meant for the project manager. They may also be used in a wider context, and may possibly be used by the project manager to make recommendations to the steering group regarding project planning, execution and follow-up.

The Annex is based on the simplifying assumption that there is a single project manager for the project. This is of course often not the case; there may be several levels of project management, so administrations can interpret *project manager* to mean *project management team* or *sub-project manager* where that will be more appropriate for the local context.

The Annex is divided into three areas in which tax administration feedback shows that there is potential for significant success as well as room for making mistakes:

- Observations related to project planning
- Common project manager tasks during project preparation
- Common project manager tasks during project execution

Tax administrations – and other organisations – often discuss the dividing line between business projects, digitalisation projects and ICT projects. Some claim that there should be no ICT-projects in government, arguing that all projects should fulfil a business purpose. Others claim that every digitalisation project is an ICT-project because of the heavy reliance on technology. The best way forward may be to employ holistic thinking for every project, assuming that whenever there is need for modifying the business of taxation, there will be need for technological changes and vice versa. Regardless of the outlook, it is advisable for the tax administration to ensure that the plans for ICT development are continuously rooted in the objectives, whether they come from a digitalisation strategy or a more generic strategy.

Observations related to project planning

Preparing user involvement

It is highly recommended to involve the users of a taxation system in deciding how the system should work, whether the system is built, procured or rented. While a tax administration IT department will have significant expertise in this area and will often have acquired significant in-depth understanding of tax processes, unless users are fully involved in design the chosen system may not have the right capabilities, including for potential future extensions.

Areas and phases of the projects where users ought to be involved vary with project type and scope but typically include

- defining requirements;
- evaluating prototypes and pilots;
- testing user interface usability;
- testing end-to-end functionality; and
- preparing training.

The project manager can perform a mapping of which user groups to involve with the assistance of key project members and other administration staff. Apart from different taxpayer groups and administration staff, the user groups may for instance include ICT staff from organisations with whom the tax administration will exchange data, and tax agents and other intermediaries.

One way to ensure adequate user involvement is the methodology known as *design thinking*: While this methodology includes all three dimensions of user needs, technological possibilities and business profitability, it emphasises the need to start with the human dimension. (Brown, 2008^[47]) Several tax administrations have mentioned that design thinking contributed to their success in digitalisation or digital transformation projects. For instance, in a case study from the Kenya Revenue Authority Digital Transformation Journey⁶⁸, Ms. Gladys Kitony writes that “Tax administrations should use design thinking approaches to solve taxpayer problems and develop solutions ... By leveraging on design thinking, the tax

⁶⁸ The Case study is available in <https://oecd.org/tax/forum-on-tax-administration/publications-and-products/Kenya-Digital-Transformation-case-study.pdf>.

administrations will be able to resolve complex issues and challenges faced by taxpayers in an effective manner.” (Kitony, 2019^[48])

The user interface may also be designed in collaboration with *usability* experts,⁶⁹ as this can help to ensure that it is easy and intuitive to use, reducing the need for training. Furthermore, when a user says that something doesn't work well during piloting and testing, the usability expert can often explain what can be done to make it work better. For interfaces meant for taxpayers, where the opportunity for training is limited, it is particularly important to offer intuitive interfaces.

Preparing business process mapping

It is recommended that the project manager plans for all business processes affected by the scope of the project to be mapped, where the team mapping and if necessary redesigning each process includes members covering all necessary disciplines, as outlined below in the section on staffing the project.

If possible, the redesign is done in close collaboration with those creating the ICT solution which will support the process, to ensure that opportunities offered by ICT are optimised. If this is not possible, for instance due to procurement of a COTS package, having the redesign completed before starting the procurement process probably gives the best possible foundation for procurement of the right solution. Note that this may lengthen the project if it turns out that the processes assumed by the COTS package differ significantly from the ones in the administration.

Preparing change management

Experience shows that resistance to the changes coming with digitalisation may have different reasons; some members of staff are quite comfortable with status quo, while others may feel that their job is threatened due to digitalisation, or they may be afraid that they will not have the right skills for the future after digitalisation. Regardless of the underlying reason, the resistance is likely not only to hamper the digitalisation project itself; it is most probably going to negatively influence the external opinion concerning the changes as well. The changes therefore need to be carefully prepared by a team which includes human resource specialists, change management specialists as well as staff with tax and technology skills.

There is a multitude of change management guidance available online; one of them is the ADKAR model (Hiatt, 2006^[49]), which suggests that the stakeholders need:

1. Awareness of the purpose for the coming change;
2. Desire to change creating motivation;
3. Knowledge regarding how the change will be implemented;
4. Ability to perform new tasks after the change; and
5. Reinforcement to sustain and strengthen the change.

The box below with the linked video introduces the change management approach of the Norwegian Tax Administration as further inspiration and guidance.

⁶⁹ Here is one possible definition of usability: «Usability refers to the quality of a user's experience when interacting with products or systems, including websites, software, devices, or applications. Usability is about effectiveness, efficiency and the overall satisfaction of the user. » <https://www.usability.gov/what-and-why/usability-evaluation.html>.

Box 7.9. Norway: Change management approach in digitalisation projects

NTA introduced change management as a mandatory part of every project from 2011 – 2012. Change management was also added to the method for project leaders. This meant that all new projects had to perform an evaluation to assess whether the project needed to involve dedicated people with competence in change management. The result of this was that change management got involved early in the projects, and one was able to work with the change management perspective throughout the project.

These years of experience with dedicated change management teams have materialised into NTA's own method for change management. When NTA estimates the involvement of change management in new projects, the method recommends allocating approximately 12% of cost and personnel to change management.

After the NTA introduced change management in every project, NTA experienced a higher degree of success and return of investment.

Some benefits of working dedicated with change management include:

- Stakeholders are more involved, and their needs are better taken care of throughout the project, resulting in higher satisfaction among the stakeholders.
- The organisation is involved and trained continuously throughout the project, causing lower loss of productivity.
- An organisation that is informed and involved early, can start the adaptation of the change sooner. This leads to less noise from managers and employees, provides the opportunity to handle opposition early and thus lower the loss of productivity.
- Dedicated involvement of affected middle managers enables them to conduct their own change management in their part of the organisation. The result is more satisfied employees and a greater compliance.

In NTA's project for modernising the IT-system for excise duties, the change management team was composed of seven people. The leader, who had the main responsibility for the change management. One person who had the main responsibility for the communication strategy, another for competence strategy and one for pilots. The rest of the team had dedicated deliveries for which they were responsible. This included follow-up of the stakeholders, producing communication articles, establishing and executing the training plan and implementation plan, as well as measurements of implemented changes. Assigning specific responsibilities to each of the team members, enabled the team to keep track of the different parts of the project as the development progressed, while still being coordinated.

An important part of the change management strategy was to start small and build experience. When the first delivery was ready, it was made available only to a small part of the external stakeholders. After verifying that there were no major errors, it was made available to the rest of the external stakeholders. This approach was used for most of the deliveries. The main take-away from this approach was that there will always be errors, and only exposing these to a small population reduces the impact and makes it easier to handle.

The main deliveries from a change management team are:

- Stakeholder analysis- one of the most important documents, where NTA describe all the stakeholders in detail. This include managers, employees and other projects who are being affected or affect the project. This is the starting point for all other plans.

- Change analysis – an analysis of what the change means for each stakeholder, this might be how their processes will change or how some new technology will affect them.
- Plan for communication – A detailed plan and strategy for communication. This includes when and how to communicate with the internal and external stakeholders.
- Plan for competence – A plan for when and how to teach the stakeholders what they need to know to embrace the change.
- Plan for implementation – A plan for how to implement the change, this can be a pilot on a small population or a big bang implementation.
- Measurement of the implemented change – A plan for how to evaluate whether your project reaches the planned return of investment. Some examples of measurements include questionnaires or interviews.

Note: For more information see the video at <https://vimeo.com/566993432/8a82b6f263>

Source: Email from the Norwegian Tax Administration July 2021.

Common project manager tasks during project preparation

The project manager is commonly the coordinator of all project activity from the moment of being assigned the role until the project is closed down. Although many decisions will happen on steering group level, the project manager will usually influence these decisions by analysing alternatives and delivering a recommendation to the decision makers. Similarly, although the project manager normally will have specialists to turn to for guidance and support in areas of particular complexity, coordination of all decisions and activity threads is normally done by the project manager.

Project management literature and training will go a long way in preparing the project manager for their responsibilities and tasks, as will previous experience, and this Annex cannot possibly cover all necessary project management guidance. Nevertheless, some tasks can be considered so crucial for the success of every tax administration digitalisation project that they have been included in this report. This section focuses on such tasks during project preparation, while the next section focuses on tasks in the execution phase. Less experienced project managers or project managers facing particularly complex digitalisation projects may also consider requesting external assistance or mentoring as discussed in Chapter 7.

Planning for knowledge transfer

One of the most important principles of planning a digitalisation project may be to plan for sustainability: The introduction of a sophisticated ICT system supporting efficient tax administration processes will not benefit the administration, taxpayer and jurisdiction economy in the long run unless the changes can be sustained after closing the project. This requires planning for knowledge transfer from project members to internal resources during the project. An activity easily forgotten because it doesn't show up as part of a project deliverable, the knowledge transfer should be included in the project plan in all relevant areas.

Planning stakeholder communication

A well planned digitalisation project includes a communication plan which covers both external and internal stakeholders. In this context, the term communication includes information. There should be a separate communication plan per significant stakeholder group, based on information from the digitalisation strategy about which groups will experience what changes. Some stakeholders need to be informed about coming

changes, some have to be consulted about changes, and some have to be monitored for their feedback regarding the changes. For instance:

- Media plays a significant role in influencing public opinion, and keeping them informed – and if possible motivated – usually contributes to successful digitalisation. Furthermore, when considering a major change like digitalisation, the administration needs to plan collaboration with parts of media that can help communicate the change message to taxpayers.
- Social media can be monitored for reactions to the changes related to digitalisation, and negative reactions taken into consideration.
- Staff should be heard and informed; in addition to improving the project results, it is likely to have a positive effect on motivation. In a study from 2015 of 13 developing country tax administration digitalisation projects, one of the major challenges reported was limited internal communication. (ITC, 2015^[23])

Since the area of stakeholder communication requires as much communication and change management expertise as it does project management expertise, the project manager may want to ensure that such experts are involved in the planning of the plan to ensure the necessary depth and quality.

Revising the cost-benefit analysis

The cost-benefit analysis is an important tool for planning, executing and following up the digitalisation project:

- During planning, it is likely to inform the project budget and constitute a crucial part of the argumentation for why the project should be allowed to go ahead to the execution phase.
- During the execution phase, it can be used to monitor the progress of the benefits as well as the cost development, giving the project manager a basis for escalation if progress is not as planned.
- Finally, as discussed in more detail below, it can be used after project completion to follow up the benefits that are only obtained sometime after the project has closed down.

The cost-benefit analysis developed during the work with the digitalisation strategy can usually be used as a basis, but will most likely need a revision during project preparations. More detail can be added at this stage:

- Costs and benefits can be quantified wherever possible.
- Timing can be added to benefits as far as it is known.
- Known prerequisites for obtaining the benefits can be described, along with the description of the individuals or units responsible for following up benefits throughout the project to ensure that they materialise. For instance, a change in the line organisation may be a prerequisite for reaping a benefit from the project; the line manager would be responsible for ensuring that the change occurs in time for the organisation to reap the benefit.
- Where applicable, principles for measuring the degree of successful outcome can be outlined, to ensure that the design of the deliverable allows for such measurement. An example of such measure could be the percentage of taxpayers moving from a costly to a less costly service channel.

Whether the project team is capable of revising the analysis by itself or outside expertise is needed depends on local circumstances. Regardless, the results of the analysis should be evaluated by someone outside the project team, to ensure an objective evaluation and avoid any suspicion of bias in the analysis.

Project risk analysis

Continuous risk management throughout ICT projects is usually considered a crucial success factor. The project manager will normally plan for regular risk analysis sessions throughout the project. Depending on the project phase, this may be every week, every three weeks or every month. Risks with high probability and consequence are dealt with, and escalated if necessary.

There is an ongoing argument within the project management profession about whether the term *risk* implies both negative and positive risk, or whether positive risk should be described as opportunities. For simplification reasons, this report assumes that risk is something undesirable. Opportunities ought to be exploited, and regular benefit reviews throughout the project, as suggested in the project execution section, can be used to ensure this.

Since risk management is a well-known discipline in most tax administrations, there should be ample opportunity to reuse methodology. This report therefore just repeats the basic principles.

Risks are typically described with

- a risk description – of what can go wrong;
- an evaluation of the probability that it goes wrong;
- an evaluation of the seriousness of the consequences if it goes wrong;
- actions that may reduce or remove the probability or reduce or remove the consequences; and
- assigned responsibility for the mitigating actions – often with a deadline per action.

It is usually a good idea to present the risks on a graph with probability and consequence as x- and y-axes and colour-coding of risk according to cost (probability multiplied by consequence), as this gives an immediate visual image of which risks are the most pressing. Templates for risk analysis which include graphic rendering of the risks are often part of project management applications; they can also be found online or be produced with a spreadsheet tool.

Important risks to consider for tax administration digitalisation projects include but are not limited to:

- Lack of skill necessary to develop the ICT system
- Lack of skill necessary to use the ICT system
- Trained staff leaving the administration
- Lack of change culture in the administration
- Unrealistic time or scope expectations among stakeholders
- Issues or failures related to migration from old to new systems
- Data security and privacy issues
- Data quality issues.

The Canada Revenue Agency has developed a Risk Exposure and Tolerance Assessment tool which can be used as a framework for project risk analysis. The version available online has been prefilled with common risks related to readiness for sustainable remote working as an example, and can be modified as desired. (OECD, 2021^[50])

Staffing the project

The project manager is likely to only have an advisory role in staffing the project, but can give recommendations to ensure that all necessary disciplines are adequately covered. While ICT skills are crucial for success, so are change management skills, business process mapping skills and in-depth understanding of each tax process that will be affected by the project.

If software development is part of the project scope, the project will most likely have some team members working on redesigning business processes and others working on software development. A proven success factor in such projects is to assemble **cross-functional teams** where each team includes tax experts, process experts and ICT experts and is given the responsibility for a set of related business processes; the team will reengineer the processes and develop corresponding ICT functionality. For each team to be effective, the team leader must be able to make people from different backgrounds – often using different sets of internal terms and concepts – communicate and cooperate constructively. This bridging role should not be underrated.

Depending on the size and complexity of the project, and the context in which it occurs (ref. suggestions related to program management above), it may be useful to organise the project work in a more or less independent unit which includes external and internal staff, as illustrated by the example from Jamaica in the following box.

Box 7.10. Jamaica: Project Support Office

Tax Administration Jamaica established a Project Support Office with dedicated staff members contracted to coordinate the full implementation of the new Revenue Administration Information System (RAiS). The Team comprised of persons drawn from the private sector to provide ongoing support alongside in-house development personnel (technical and business experts) seconded from Tax Administration Jamaica. This approach was necessary to facilitate knowledge sharing and proper coordination of the Project.

The establishment of independent project office benefited the digitalisation process of Tax Administration Jamaica in the following ways:

1. It allowed for synergy among team members
2. Seamless knowledge transfer among team members
3. Allowed for faster turnaround time of work items
4. Facilitates alignment of activities with other projects in the organisation.
5. Systematic and coordinated implementation of solutions
6. Ensured that training and knowledge transfer programmes adequately address the business needs such as developing expert users.
7. Ensured the alignment of business requirements with the strategic objectives of the Authority.
8. Integrated change management with the rollout of the solution.
9. The monitoring of legislative changes and other relevant changes within the environment to ensure digitisation of these changes.

Source: Tax Administration Jamaica, February 2021.

Right time planning

The right time to plan can be a significant challenge for digitalisation project managers, since there are multiple ways to fail:

Too much detail: Inexperienced project managers sometimes make the mistake of producing too detailed plans too early. Throughout the digitalisation process, circumstances will change, and the administration will gain knowledge and experience with digitalisation which will be essential for the detailed planning of

future deliveries. Planning with too much detail early on invariably leads to waste of planning resources, costly re-planning and frustration for project management and team. For instance, the plan may specify that the administration will implement some degree of prefilling of tax returns for personal taxpayers. If the steps implementing prefilling are going to take place years after planning the project, it would be a mistake to specify which categories of information will be prefilled (wage and salary, interest, pension, dividends, capital gains/ losses etc.) in the initial plan and lock the project budget to these categories, because the opportunities for prefilling may change considerably in the coming years.

Too little detail: On the other hand, lack of upfront coordination of legislative, human resource and technical changes may lead to costly delays or budget overruns. For instance, major future changes involving public or private entities should be coordinated, including timing of the launch of digital interfaces.

The project manager needs to ensure that the two often opposing goals of predictable budgeting and adaptability to changing circumstances are balanced. To simplify that task, governance regulations for the plan can include sign-off of modifications to the plan when necessary.

Common project manager tasks during project execution

Most project manager tasks during the execution phase will on the one hand be anchored in the manager's responsibility for following up scope, time, resources, quality, risk and future project benefits while supporting project staff and ensuring the best possible working conditions for them. On the other hand, each task will be adapted to the unique mandate of that particular digitalisation project and the context in which it operates. Consequently, it is quite limited what can be offered in terms of generic recommendations for tax administration digitalisation projects that have reached the execution phase. The areas mentioned in this section are therefore included because experience from other administrations shows that mistakes often happen in these areas. Quality project management execution is implicitly assumed.

Changes to ICT solutions, processes, organisation and legislation

Given the importance of processes, legislation, organisation and ICT solutions working together, the task of coordinating changes to all these elements may be where failures may most easily occur. Ideally, the project manager and the team maintain the attitude that change is expected and good, because it improves the end results.

ICT solution changes: Depending on earlier choices, the ICT solutions may include physical infrastructure, networking and computers as well as the software being developed or procured. Common mistakes in this context include failing to make available the necessary training and test environments as well as test data, and failing to produce automated testing regimes that can be easily reused every time a change occurs.

Legislative changes: The project manager (possibly delegating this to the legislative team in the project) will monitor the progress of the legislative work, to ensure that project plan milestones for legislative changes timed with project deliveries are on track. In most complex projects integrating expected legislative changes, it will happen that legislative processes are delayed or halted, for instance due to governmental changes. If and when this happens, the project manager with support from the steering committee may need to re-plan the project to work around the legislative issue.

Process changes: From an ICT-development point of view, the tax administration process changes would ideally have all been defined and agreed before development started, but in practice most administrations find the need for continuous process change as the process is used for real along with the supporting software. Practical process use is likely to uncover flaws and opportunities for improvement better than

any other method. This reality should be the part of the mind-set of the entire project team, so that changes can be executed swiftly and efficiently as needed.

Organisational changes: While the project manager may only be observing rather than actively participating in the execution of the organisational changes deemed necessary to accommodate the consequences of digitalisation, an important project management task is to ensure that the changes occur in synchronisation with the other project changes, so that for instance training programs, ICT equipment and facilities are standing ready in time for the staff that are assigned new tasks.

Monitoring benefits development

Since the project benefits are the purpose for which the project exists, the importance of following them up from start to project finish can hardly be overstated. Circumstances are bound to change throughout the project, and benefit follow-up can therefore include following up opportunities for benefits unknown at project start, following up staff and managers outside the project responsible for tasks that influence the successful achievement of benefits, as well as following up the project tasks that will lead to the agreed benefits. The recommendations for following up benefits after project conclusion offered in Chapter 4 therefore also apply during the project, under the responsibility of the project manager.

In smaller projects, this work may be handled directly by the project manager, while for larger projects, following up each benefit may be assigned to different people or units. Nevertheless, the project manager should oversee all benefit monitoring in order to uncover lack of progress and escalate issues if necessary.

Performing roll-out

Successful roll-out rests on three obvious pillars: A carefully designed roll-out plan which includes communication measures as necessary; high quality deliverables that can be rolled out in a timely manner; and careful coordination by the project manager or the one to which the task has been delegated. Some potential pitfalls to avoid in this context include:

- It is important to maintain the same flexible attitude to the roll-out plan as to the project plan itself. Ideally, the experience of early roll-out phases will be used to modify later ones, optimising the process as the project progresses. This includes both the product to be rolled out, as users may find errors that need to be fixed or opportunities for improved functionality, and improvements to the plan itself including communication activities.
- The technical roll-out of network, computers and software often needs to be coordinated with communication campaigns using for instance radio, TV, newspapers, social media, tax administration home pages and intranet pages, as well as education campaigns internally and externally as needed.
- Experience from tax administrations shows that when fraud opportunities due to paper-based processes or corruption are removed through digitalisation, the fraudsters will seek other opportunities based on the new digital solution. The project manager should encourage the administration's fraud experts to focus specifically on opportunities for fraud opening up with the new system as part of the roll-out process.

Phasing out old systems

To avoid cost overruns, it should be clearly stated in the project mandate whether phasing out of old systems is part of the mandate, or if this will be handled by a different project or the line organisation. Assuming that the task has been placed in the hands of the project manager, the phasing out may need both technical and logistical preparations depending on the background. Many administrations have found

phasing out of the old system that was meant to be replaced by the new system to be a considerable challenge, and that the resistance typically comes for two reasons which requires different solutions:

- Some staff prefer to continue using the old system due to common change resistance reasons like fear of the unknown or fear of making mistakes. Others may appreciate the personal benefits of being the experts of the old system, fearing that using the new system will not give them the same status. Such issues can be handled like other change management issues, as suggested earlier in the report.
- Other reasons for being unwilling to let the old system go may be quite practical: It often happens that some or all data from the old system are not converted and imported to the new system because of high conversion cost, so users may need to be able to look up information in the old system after having started using the new one. Keeping an old system up and running in parallel with the new system may become prohibitively expensive. It may also generate new problems if, as is likely, data produced in the old system does not get automatically migrated to the new system. A good solution to this issue may be to change the access to the old system to read-only and leave it in this state for a number of months or years. This will allow users to continue looking up historic information about taxpayers and their cases, while simultaneously guaranteeing that new data is only produced in the new system.

Performing project-closing activities

Once systems have been rolled out and are in use by taxpayers and staff, and before the project can be phased out, the project manager still has some remaining tasks to follow up, to ensure that they are not forgotten:

- The responsibility of maintaining systems delivered by the project must be turned over to the line organisation (unless the administration has chosen a DevOps model).⁷⁰ Although this is mostly a technical task performed by team members, the project manager must ensure that the necessary team members stay on staff until the handover has been completed.
- Every remaining project activity must either be accepted as being removed from the project scope by the steering group, taken over by another project, or taken over by the appropriate line manager. This sometimes becomes a tedious and complex process, especially when there is a large number of relatively small outstanding tasks, but should nevertheless be carefully executed to maintain the good reputation of the project staff and the administration.

Most experienced project managers also ensure that turning over staff responsibility from project to line if relevant, producing lessons learned documents and securing the appropriate publicity for successful project closure are part of their activity list before signing off. One of these is particularly important for virtually every project: Experience shows that project managers spending time and effort on a thorough lessons learned process delivers significant benefits for future projects to the administration. If the administration doesn't supply a template for the lessons learned document, it can be retrieved from one of the reputed project management methodology organisations.

⁷⁰ The Software Development Strategy section in Annex D contains a brief description of DevOps.

Annex D. Observations related to ICT solutions and software development



While digitalisation projects are inherently concerned with information technology, most of this report concentrates on the areas where digitalisation interfaces with other aspects like strategic direction, business process redesign and organisational changes. This Annex however focuses on topics that pertain directly to ICT and software development that tax administrations have identified as key issues or considerations. It starts with more detailed observations related to choosing core ICT solution, building on the summary presented in Chapter 4, and continues by covering some ICT topics that the administration may consider in the context of a digitalisation project. The intended audience for the Annex includes managers, project managers and staff preparing the ICT-related aspects of the digitalisation journey.

Choosing core ICT solution architecture

For administrations that aim to replace or consolidate their core ICT solution architecture, having made a careful consideration of the consequences of the choice makes the selection easier and increases the probability that the best solution under the current circumstances is chosen. Although the list of factors to consider, common pitfalls and post-decision considerations is long, it is not exhaustive; the local situation must also be taken into account.

This section covers the same three common choices as in Chapter 4: Building software according to the needs of the administration (Build), buying ready-made software (Buy), and renting ready-made software (Rent).

Factors to consider

Factors to consider when making the choice include some that most would consider crucial and a whole range of others that may come into play.

The factors generally considered crucial include cost, functionality and best practice:

- **Cost:** The total cost over the lifetime of the system has a natural place in the consideration,⁷¹ and this typically involves two primary cost elements: Investment cost and Operational cost.
 - For budgeting purposes it can be expected that the *investment cost* of the three options range from high for Build via medium for Buy to very low for Rent.
 - The *operational cost*, which often comes from a different budget, will probably range from relatively low for Build and Buy, though highly dependent on the individual system, to quite high for Rent. In the longer term, the cost of renting software may be significant, and it may change according to modules rented. For the Buy option, the maintenance license typically costs approximately 20% of the initial license fee. Administrations that develop their own software may need to budget for at least a similar cost in software maintenance. There are examples of tax administrations who ended up starting a new procurement process a few years after implementing procured software because the software quickly became outdated and the original software contract did not include continuous upgrades.
- **Functionality:** With Build, the administration will be able to ensure that exactly the necessary functionality is available; no more and no less. Conversely, with Buy and Rent, the software vendor decides what functionality is most likely going to be needed; although most vendors will offer some degree of modular approach where customers pay for modules of functionality and continuously seek to improve their offer, there will probably be some functionality that the administration asks for but can't get, and some that it doesn't need but ends up receiving and paying for. An informed choice in this regard requires the administration to take the time to explore the market for Buy and Rent taxation software solutions, as well as having acquired an in-depth understanding of the needs to be fulfilled by the ICT solution.
- **Best practice:** A number of reputed software vendors that offer Buy and Rent solutions have spent years researching what is best practice within the areas of taxation covered by their software, and the solutions that they have developed support the work processes that in their experience are considered most efficient and effective, which is often referred to as best practice processes. Even the most sophisticated ICT department of a large tax administration may not be able to match the experience of a whole range of administrations worldwide that have contributed to the development of Commercial Off-the-shelf (COTS) or Software-as-a-service (SaaS) solutions, so this may be a

⁷¹ The term TCO – total cost of ownership – becomes slightly misleading when renting software is a possibility, so maybe total cost of usage (TCU) may be a better concept on which to base the decision.

weighty argument in favour of buying or renting the taxation software. If the administration finds that none of the solutions available for buying or renting include the functionality deemed necessary for its tax processes, it may be pertinent to consider revising the processes.

Other factors to consider include:

- **Interface languages:** If the paper forms that are being replaced by an ICT system are available in several languages, the ICT system should support the same languages. This may be a significant added cost, and if the user interface of the bought or rented ICT system has not been designed from the start with multi-language support, the cost will most likely be prohibitive.
- **Accessibility:** It is generally recommended to follow the principles of universal design when modernising through digitalisation, to accommodate for disabilities like visual impairments; this will allow the solution to be usable for as many taxpayers as possible.⁷² This may already be handled in Buy and Rent solutions, but may come as an added cost for Build solutions if it is not calculated in early on.
- **Technical platform:** For Build and Buy solutions, the administration normally has to procure the necessary computers, and this may influence the cost and complexity of the project. For instance, some systems include client software to be installed on every computer with access, while other systems are entirely server-based using only a web-browser interface for users.
- **Available expertise:** For smaller countries, it may be a challenge to procure the necessary support from national companies. Some software vendors, for example, may not have local representatives, or may be represented by local companies with only sales and marketing staff. Having to hire consultants internationally may have significant impact on the project cost.
- **In-house expertise and equipment:** Some smaller administrations don't have an ICT department, and are clearly not equipped to build and maintain their own ICT solutions. For larger administrations, whether Build is a relevant option will depend in part on the capacity and capability of the ICT department. Similarly, smaller administrations lacking server rooms and failover server rooms equipped with air-conditioning and fall-back power supply either have to invest in such infrastructure, including this cost in their digitalisation budget, or choose ICT solutions without on-site equipment (i.e. SaaS).
- **Tailoring COTS solutions:** Buying a pre-built solution does not necessarily mean that the administration will have access to all necessary functionality, since the pre-built software is meant to cover general requirements. Many administrations solve this issue by either paying for specific changes to the COTS package or performing such changes in-house. This can represent a challenge every time the standard package is due for upgrade; local variations can increase the cost and time of upgrade or in extreme cases make upgrades impossible. This complicating factor ought to be part of the picture when considering buying COTS solutions.
- **Hardware platform for COTS solutions:** If the COTS vendor can offer a software solution which can use a platform (computers and operating systems) already in use in the administration, this will considerably lower the cost of ICT infrastructure and ICT staff training. However, this may also increase vendor-lock in, which limits the administration's future flexibility.
- **Hardware platform scaling:** When building or buying software, it is usually the administration's responsibility to procure the necessary hardware for running the solution, and the hardware needs to be scaled to handle peak traffic. The scaling of the hardware is, among other factors, linked to the purpose of the system, the number of concurrent users, the number of transactions and the characteristics of the system. For instance, the load on systems receiving data from electronic

⁷² See for instance <http://universaldesign.ie/What-is-Universal-Design/The-7-Principles/>.

fiscal devices (EFDs) varies considerably with both the number of EFDs and the characteristics of the data sent from the EFDs.

- **Configuration vs. development:** It may seem that the Buy and Rent options offer a system which is ready to use immediately after installation, but this may be far from the truth. There will almost always be need for configuration in order to adapt to local legislation, organisation and processes. The administration therefore essentially has to choose between spending time and money on configuration or spending it on development – or as is done in configurable Built systems, on both development and configuration. Many administrations choosing to build their own solutions opt for a similar approach, increasing the flexibility and adaptability of their software while also increasing the cost of development and adding configuration cost.
- **Data transfer between cloud systems and on-site systems:** One of the factors that may increase the cost of cloud solutions is the amount of data sent to and from the cloud. Some cloud vendors charge per gigabyte of data transfer, and if on-site systems need to exchange considerable amounts of data with the new solution, this may drive up the cloud solution cost to an unacceptable level.
- **System sustainability:** For the Buy and Rent options, it is crucial for the system's sustainability that the vendor has a stable financial base and a transparent plan for continued improvement of the system. Although the system's capability and quality at the time of signing the contract is important, long term sustainability is equally important; the investment will be lost if the vendor chooses – or is forced due to financial difficulties – to stop developing the system. Consequently, the vendor and its future plans should be carefully evaluated, including the schedule for maintenance and upgrades. The same is true for the hardware and operating system on which the taxation system relies for Build and Buy options.
- **Functionality timeline vs. project timeline:** If the administration chooses to buy or rent core tax administration software, it has to go through a usually lengthy procurement process followed by the process of installing (when buying) and configuring the software. Consequently, it may take quite a long time, possibly years, from the moment the requirements are ready until a user can use system functionality for the first time. This can be contrasted with the possibility of in-house developed software based on agile development methodology, where the first functionality may be made available to users within a few months of starting the project and weeks after defining the requirements. However, when considering the length of the total project, the Build option is likely to take longer, since it includes a software development cycle rather than buying or renting pre-created software.

The following IMF publications offer alternative views, further experience and advice related to the choice between buying or building the core tax solution and implementing a COTS tax system: (Cotton, 2017^[51]), (Cotton, 2017^[52])

Common pitfalls

Common pitfalls related to core ICT systems vary according to type of solution, and some are related to more than one type.

- **Lack of business process adaption:** This is a commonly cited issue in research and interviews with tax administrations. Projects based on buying or renting ready-made software may fail to reach their potential if the administration is unwilling to adapt its business processes to the best practice processes built in to the software solution. For instance, using an example from debt collection software, the vendor may have prepared the software to immediately start an enforced collection process for a debtor the moment information about new assets is made available. If the collection department insists on continuing with enforced collection for one district at a time, the administration will lose opportunities for debt recovery that are only available for a short time.

Similarly, projects based on building software may fail to reach the full potential because business processes that are to be supported by the software have not been carefully assessed and revised before designing the software.

- **Lack of integration:** Projects may fail to reach their goals due to lack of integration between the new software and other ICT solutions. Continuing the example from debt collection software, the vendor may have failed to prepare for event-based import of asset data from external sources. If information about available assets is only imported to the system at regular intervals, it will not be possible to seize assets as soon as they became available. Lack of flexible integration solutions may be a red flag when considering a software package for core tax functions, and integration possibilities should be a fundamental feature of software being built.
- **Issues with data ownership:** Some tax administrations have discovered too late in the process that there was a clause in the contract for buying software that gave the vendor partial or full ownership to the data generated through the system. For taxpayers it would seem unacceptable if a private entity owns and possibly has access to sensitive data about taxpayers, and it would represent significant issues if a private entity is able to set limits other than those given by legislation about how the tax administration can use data.
- **Issues with legislation:** If the administration does not coordinate the changes to software and processes with changes to legislation, the system may not be allowed to be rolled out. Examples of legislation change areas:
 - Projects based on buying or renting software that has been developed according to what is considered best practice may require legislation changes in order to use the software; the legislation of the jurisdiction may not allow for the processes supported by the software.
 - Projects based on renting software have to ensure that the necessary legislation for using such solutions is in place – or will be in place in time. Currently, cloud-based solutions are not allowed in many countries due to data privacy and security issues. If public international cloud solutions are not an option, the tax administration could explore options ensuring that taxpayer data will not leave the jurisdiction.

Post-decision considerations

Regardless of choosing build, buy or rent or a variation, the administration will need an in-house ICT infrastructure with for instance network, on-site or portable IT access for employees, and security features (virtual private networks, firewalls etc.) for every location. If this is not already in place, the procurement and installation of this equipment should either be in place before the start of the digitalisation project or be done early in the project.

Similarly, it is highly recommended that the administration has a strategy for comprehensive tax data management which at least includes correct metadata, adequate security measures and clear data ownership.

- **Metadata:** Information about the data elements, often collected in a metadata catalogue, helps the administration's ICT department as well as its users. The metadata may for instance include structural information like data type and number of records; quality information like validation rules, data quality and data density⁷³; and relational information like possible integration with data in other systems. The metadata should be shared among all units using the corresponding data across the

⁷³ Data density describes if a field in a record is hardly ever, sometimes or almost always filled out. For instance, having a field for business category in the record describing a business is only useful for analysis if it almost always contains a value.

administration, and ideally the parts of the metadata catalogue relating to data shared with other public or private entities would be available in a government-wide catalogue.⁷⁴

- **Security:** An important aspect of the quality of the tax administration work is upholding jurisdiction regulations about data privacy and security. Not only is this important from a legal point of view, it is also crucial for the reputation of the administration – which tends to influence tax compliance. Quality data management therefore includes ensuring that a tax official only has access to the taxpayer data necessary to complete the official’s tasks, and that the data is safe from external prying attempts.
- **Ownership:** Every data element in the administration’s systems should have a defined owner who is responsible for its quality. For instance, data related to VAT filing can be owned by the function responsible for VAT. This will ensure higher data quality and simplify discussions regarding integration between data elements.

The box below summarises the experience of the Swedish Tax Agency with regard to information management and data governance.

Box 7.11. Sweden: Components of information management and data governance

The Swedish Tax Agency (STA) identified the key components of good information management and data governance to be:

- Legality
- Protection against distortion and unauthorised access
- Availability and Reusability
- Information quality
- Ethics
- Balances of interest
- Ownership and Responsibility (Accountability)

Source: Email from Swedish Tax Agency, October 2021.

Software development

Tax administrations with in-house ICT departments often choose to perform some software development rather than buying all software ready-made; the extent of in-house development may vary from developing a few specialised interfaces to creating complete systems, and the development team may consist of mostly hired consultants, only employees or something in-between. This is an area with ample opportunities for creating ingenious solutions as well as making costly mistakes. Summarising opportunities and challenges that have come up in interviews and through research, this section records a range of observations related to software development in the context of developing country tax administrations, and touches on some trends in software development that are worth considering for tax administration ICT departments.

⁷⁴ For an example of a government-wide data catalogue, see <https://data.norge.no/about>.

Software development strategy

Although there is no single correct software development strategy for all digitalisation projects in all tax administrations, variations of agile development are increasingly chosen over than traditional software development (often called waterfall methodology).⁷⁵

The key difference between agile software development and waterfall methodology is arguably how requirement changes are handled:

With **waterfall** development, the user representative normally signs off on a set of requirements for the software that is to be developed. The developers then design, develop and test the software internally in their organisation as they interpret it to be described in the requirements. Then the users test that the software fulfils the agreed requirements, after which the software goes into production. Any need for changes that arise during the design, development and testing will have to be handled through a formal change request with corresponding budgetary adjustment (usually increase).

Since all the initial requirements are delivered and signed-off as a whole, it usually takes a long time – sometimes years – from requirements sign-off to completed testing. The name of the methodology comes from the fact that when a phase has been completed, it cannot be revisited; water only falls down.

The principle of not being able to return to a previous phase has at least two unfortunate consequences:

- In the time period from requirements sign-off to software completion, the world will change, and the user needs will change accordingly, but the changed needs will not be reflected in the software unless covered by additional change requests and increased cost.
- When users are being told that they have to describe all the requirements for a software solution that they may not be able to use for several years, they will in most cases ask for functionality that they don't know for sure if they will need, to be on the safe side. Some of this functionality will never be used.

With **agile** development, change is anticipated and planned. A software module may be developed, tested and rolled out, then changed, tested and rolled out several times to accommodate new needs.

Agile development is based on the Agile manifesto. The manifesto suggests a change of emphasis, for instance from documentation to working software and from following a plan to responding to change.⁷⁶

The arguably most common variation of agile software development is Scrum. The following description of the methodology, though not complete, is included to help the tax administration consider if the methodology could be used in their digitalisation projects:

- The methodology is centred around teams that develop small components of ready-to-test software within predefined time periods (often three weeks), based on a list of prioritised needs that is updated every new time period.
- The contents and prioritised order of the list are influenced by the project goals, the changing needs of the users, legislative or societal changes, and the software that has been produced up to the previous time period. The responsibility for the prioritised list lies with a person outside the development team; that role is usually called Product owner.
- During each time period the development team leader (usually called the Scrum Master) shields the team from outside disturbance and assists with removing obstacles in order to optimise the efficiency of the process and the quality of the software produced.

⁷⁵ Waterfall methodology and agile methodologies are also used as project management methodologies, as well as in other areas where work is organised.

⁷⁶ <http://agilemanifesto.org/>.

- After every time period, the finished software components are demonstrated and tested together with users.
- A software component given top priority can be either new functionality, added functionality to an existing component or fixing an error in an existing component.
- Special arrangements can be implemented for larger projects so that many Scrum teams can operate in parallel and collaborate on the development.

Just as there is no ideal ICT development methodology for all projects, there is no methodology with only advantages:

- The disadvantage of agile development, and correspondingly the advantage of waterfall development, is simpler budgeting. Whereas an agile project may be given a certain budget for a defined number of months and will use that money to produce software according to what the person in charge decides is most important at any point in time, a waterfall project will usually be based on an agreement describing both scope, time and budget.
- On the other hand, the examples of waterfall-based projects overrunning on scope, time and budget are so numerous that this potential advantage may be deceptive. A list of failed and over-budget software projects⁷⁷ illustrate this: Common failure reasons are scope creep⁷⁸, cost overrun and the software not being fit for its purpose. This shows the importance of supplying the right functionality – not necessarily known at the beginning of the project - while maintaining tight budget control.
- Some tax administrations considering agile ICT development have decided against it when discovering the chasm between traditional contract format with a defined scope, timeline and cost, and the agile methodology which to some extent allows the scope to be defined as the project progresses. Agile proponents argue that this is a reason for changing the contract model, not for reverting to waterfall methodology.

For those administrations choosing an agile development strategy, there are numerous sources available to guide the process, including guides specifically aimed at governmental units. For instance, the Australian Government offers a guide to agile and user-centred processes in their Digital Service Standard (Australian Government Digital Transformation Agency, 2016_[53]). Furthermore, there are numerous sample contracts for agile software development available on the internet; for instance the one produced by the Agile Business Consortium, a non-profit organisation based in the UK. (Agile Business Consortium, 2016_[54])

Administrations choosing a more traditional development strategy for the overall processes may still benefit from executing elements of development with agile or other forms of adaptable methods, especially in areas where technological changes occur frequently. This may help ensure that what is being developed is still relevant when launched.

Regardless of development methodology, it is crucial to consider the big picture while working on each component of the solution. For instance, it would probably be necessary to divide a programme for replacing a core system for tax into several projects, in order to maintain control over time, cost, scope and quality, but it is absolutely necessary to ensure that all parts integrate seamlessly.

A section on ICT Development Strategy for tax administrations written after 2020 would hardly be complete without a brief mention of the **DevOps** methodology, since this is becoming increasingly popular. The term has been created by combining the words development and operations, and although there are numerous definitions available, the central concept is generally to ensure that the developer team producing the software and the operations team responsible for the software being used become a single collaborating

⁷⁷ https://en.wikipedia.org/wiki/List_of_failed_and_overbudget_custom_software_projects.

⁷⁸ Simply put, scope creep is increase in project scope that is not included in the project plans or budgets.

team with end-to-end responsibility for working software systems. DevOps is most likely not relevant for all tax administrations, but for large administrations that develop a significant portion of their software in-house, it may, in combination with Agile software development and Lean principles for continuous improvement and elimination of waste (see for instance (Ebert, Abrahamsson and Oza, 2012^[55])) be a core element of successful software development. More information on the combination of Agile and DevOps can be found in (Hemon et al., 2020^[56]).

Preparing requirements

Interviews with tax administrations have uncovered some common pitfalls related to the important principle of having digitalisation projects deliver what the administration actually needs:

- Some digitalisation projects have failed because the requirements determined before development started had changed by the time the software was ready for testing. This has often been due to changing circumstances during the project period and long project iterations. In one case, more than 7 years passed from completion of requirements for a tax system until the last module was rolled out to users⁷⁹; in another case, it took 8 years to implement a taxpayer register system⁸⁰. Requirements should be determined as close as possible to procurement or development.
- It is important that project knowledge is retained from one phase to the next. There are examples of ICT projects in tax administrations where one company was hired to describe the requirements and another company was tasked with developing the system, leading to misunderstandings and wasted time and resources.
- Some tax administrations have made the mistake of forgetting the needs of later phases in the taxation process when setting the requirement for the early phases. If for instance the components for registration and filing are not prepared to work together with the components for back office tasks like compliance control, it is likely that they will have to be replaced or changed.
- Some tax administrations have made the mistake of not including requirements for a flexible interface with other systems when describing the requirements for the core system, leading to the need for expensive workarounds or replacement of almost new components.

Designing good taxation software

Although this report does not aspire to give a comprehensive introduction to good software design practice for tax systems, a few central principles are included, grouped according to area:

Tax functionality principles

1. It is considered good practice that the system allows for using a single taxpayer identification number (TIN) to identify taxpayers across internal systems and external data sources.
2. Ideally, all interactions between the citizens and the government are available via a single login solution and with a consistent user interface. Where this is not possible, the tax administration should at least offer taxpayers a unified interface for all tax-related matters rather than having different portals for different tasks.
3. Taxation is complicated, and that complexity will always have to be reflected somewhere in the system. Simplifying the taxpayer interface means that more complexity is pushed to the tax office interface and the back-end system. Although it is better to leave complex solutions to tax officials

⁷⁹ Source: ATAF/FTA Workshop 22 February 2021.

⁸⁰ Source: ATAF/FTA Workshop 25 May 2021.

that can be trained rather than taxpayers that may not be reachable for training, it should nevertheless be a conscious choice where the complexity is handled. In fact, some tax administrations have made it a strategic choice to place complexity inside the tax administration in order to emphasise the taxpayer perspective.

4. The new solution should allow for close follow-up of the taxpayers contributing most to revenue, for instance large taxpayers in general and high net wealth individuals. They can be followed up with regard to registration (so that possibly the tax base can be broadened), monitoring signs of corruption and, where applicable, cooperative compliance programs.
5. Tax administrations planning digitalisation may want to consider the international aspect of their new solutions. For instance, there will probably be need for international data exchange based on the Common Reporting Standard (CRS), and there are emerging standards for e-invoicing which may reduce the taxpayer burden for multinational enterprises. Whenever an area of digitalisation is being designed, the project management can ensure that the design adheres to national, regional and global standards – and prepare to adjust to coming standards where that is the case.

ICT design principles

1. Some would claim that the front-end – the user interface – of the taxation system is the most important part; others place the emphasis on the back-end solution where most of the tax logic is being applied. Experience shows that such discussions are similar to arguing that one leg of a three-legged table is more important than the others; front-end and back-end design are equally important and crucial for taxation system success.
2. All parts of the system should be designed for change, preferably with a modular approach so that one component can be replaced without affecting the others.
3. The back-end should be designed with well-defined interfaces (see the discussion on Application Programming Interfaces below) and flexibility regarding storage – ideally along the lines of storage as a service since this will make it possible to move to cloud storage if this becomes relevant.
4. The back-end should be consistent and well integrated before the front-end is connected. Research literature cites an example from a country where none of the five ICT systems used by the tax administration interfaced with any other, and two different systems were used to generate Tax Identification Numbers. (Moore, 2020^[57]) In this case, creating a user-friendly online interface for taxpayers would most likely be a failure unless the internal systems were first modernised or replaced. A rather more successful example is cited in (IMF, 2017^[58]), where the revenue authority first modernised its internal systems before adding user-friendly taxpayer interfaces; a web interface followed by a smartphone interface.
5. The system must be able to share data with other ICT systems, keeping in mind the current and potential needs for access to data in all parts of the tax administration, other governmental entities as well as businesses and personal taxpayers. The most common interfaces should be pre-built, but it should also be possible to add on new interfaces as necessary.
6. The solutions should be designed to protect against illegal use. The safety net against corruption in the digital solution needs to cover both external and internal areas of potential corruption, and combine avoidance, reduction and detection measures. For instance: By introducing logging of which taxpayers' data are accessed by which tax officials, and making this logging known within the administration, the potential for corruption may be reduced and corruption attempts may be detected.

Data security

Tax administrations are desirable targets for all variations of hackers, including those who want to prove to the hacker community that they are capable, those who are in the hacker business to make a profit, those who seek information, and those whose aim is to damage or destroy. Unfortunately, along with the numerous benefits from digitalisation, there also follows increased risks of large scale data leaks and new areas becoming interesting for hackers.

This report cannot adequately cover all necessary aspects of ICT-security, so additional sources and experts should be consulted in this matter; the following topics have come up in relation to digitalisation of tax administrations:

- While external threats are the most obvious, security measures must also cover internal threats. The measures have to ensure that tax officials only have access to the data needed for accomplishing their responsibilities, including both read-only access and access to make changes. Furthermore, the ICT system needs to have built-in monitoring of activity, so that any intentional or unintentional misuse of data can be traced.
- With the growing trend of bring-your-own-device (BYOD) where tax officials are permitted or encouraged to use private smartphones, tablets and laptops for work-related tasks, and the teleworking trend that started with the Covid-19 pandemic and is likely to continue, the need to secure devices used for administration tasks has become even more crucial, whether they are private or administration-owned. For private devices, it is increasingly common to protect any administration-related information (like an email application) within an administration-controlled layer of security. For administration-owned devices like laptops, up-to-date software and protection against viruses and spam combined with a Virtual Private Network solution will contribute to guarding against spying and attacks on these devices. However, the most important security barrier is the tax officials themselves, so adequate training and continuing focus on security is paramount.

The benefits of small-scale development

Having a small group of users try out a digitalisation concept or solution can give valuable insight and experience, allowing the project team to adjust the course of the development with less waste of time and money:

- **Prototyping** can be used to test a concept without actually developing anything; it should be OK to throw away a prototype without wasting money. Therefore, prototyping is often done on paper or by producing mock-up screens without any functionality. Prototypes are often discussed with end users, to ensure that they will work from their point of view if they are to be developed.
- **Piloting** of new solutions can be used to build experience and adjust the design before full-scale implementation, and can lead to significant cost and time saving. This is sometimes called building successful solutions by allowing for fast and early failures. Pilots can be used to verify that a concept works throughout the entire work cycle. If the pilot solution turns out to work well, it can be expanded to become a complete product. If on the other hand it turns out not to work, it should not make significant impact on the budget to throw it away and start over, so pilots ought to be as narrow and simple as possible.
- Allowing for a **phased implementation** of a solution, for instance by introducing a digitalisation measure to one town or county before availing it to the entire jurisdiction, gives the tax administration the opportunity to learn which introduction and training measures work and which do not work, and adjust its course before full-scale roll-out. This concept is covered in the section on roll-out.

Since new technological opportunities, standards and best practices are made available at an increasing pace, the IT system should be constructed in such a manner that individual components can be replaced and changed without replacing the entire system. Common methods for accomplishing this include open systems, agile software development, and Application Programming Interfaces; all mentioned in this Annex.

Preparing for data migration

Migrating data from an old system being phased out to a new system being introduced can be a difficult and costly process with ample opportunities for mistakes, but in many cases it is a prerequisite for a successful project, since staff will need access to data related to ongoing tax cases in the new system. When planning the task, the project team should in particular consider the following:

- It is recommended to perform at least one test migration well ahead of the planned migration date, to uncover migration issues that are difficult to detect when studying the migration scripts.
- The data quality of the old system may not be acceptable, for instance due to lack of rules for data integrity. In some cases it may even be necessary to move the data set to an intermediate store for cleaning before it can be imported to the new system. Careful analysis of the old system is therefore crucial.
- The team needs to ensure clear and agreed rules for which data will be migrated and which data will only be available in the old system until it is being shut off. This is typically an area where the users and ICT developers may take opposing views: The users normally want as much data migrated as possible, while the ICT staff often would prefer to avoid data migration altogether. The optimal solution is usually somewhere in the middle. If the administration has or plans to set up a data warehouse, a good compromise for the users may be read-only access to historical data that is not being migrated via the data warehouse.

Open source software (OSS)

For administrations that choose to partially or fully build their own solutions, another question has to be considered: Should commercially developed solutions or open source software (OSS) be used? OSS is collectively built by a community which usually collaborates via the internet, and the software is made available free of charge.

- The most obvious **advantage** of using OSS is of course that the administration doesn't have to pay license fees to use the software. Another important advantage of many OSS packages is that, due to the large and highly qualified community of developers, the software is constantly improved; errors are often fixed much faster than they would be in enterprise software licensed from a commercial vendor. By the same logic, since these clever developers know that other clever developers will see their source code, they are likely to do a good job in order to maintain a good reputation among their peers. The peer pressure to produce good code combined with transparency is not necessarily as common in software companies. Thirdly, with the source code readily available, the administration's ICT department can make any changes they want in order to optimise the software for their use. Furthermore, vendor lock-in, which is a significant issue for many tax administration ICT departments, is avoided when a large community supports the software. Finally, given the prevalence of OSS in academia, there is an increased likelihood that newly recruited IT staff will be well versed in OSS tools already.
- The two most significant **disadvantages** of OSS are probably that the support available may not be reliable – although for some OSS packages it is possible to pay for support – and that the risk of hacking is higher because anyone – including the hackers – have access to the source code and can make changes. (Of course, if a hacker creates a security issue in an OSS package, other

developers may find and fix it fairly soon.) Many also point to the issue that when a community – not a company – is responsible for a software package, the package will only be updated as long as the community exists, which depends on how long the volunteers choose to spend their spare time on it.

The section covering digital identity in Chapter 5 cites an example of an OSS initiative where the disadvantages related to support and security are significantly reduced: MOSIP. This seems to coincide with a growing trend of OSS initiatives specifically for government purposes which may prove quite beneficial for tax administrations.

Application Programming Interfaces

Application programming interfaces (APIs) is fast becoming the recommended and commonly utilised technique for providing interfaces between tax administrations ICT systems and the systems of other governmental and private organisations. The box below contains one possible definition of the concept.

Box 7.12. Application Programming Interfaces defined for tax administration purposes

In the International Survey on Revenue Administration (ISORA), the partner organisations CIAT, IMF, IOTA and OECD have agreed on the following definition and explanation for Application Programming Interfaces (APIs):

“An API is a set of software functions and procedures allowing applications to access the features and/ or data of another software solution; applications can send requests to this interface and receive responses. A significant advantage of this compared with traditional software interfaces is that complexity and sensitive information can be protected inside the software solution, since communication with other applications only goes through the API. APIs allow for safe digital interaction between revenue systems and external applications in banks, accounting software providers and other government agencies. They can be used to send and receive information, validate activities and facilitate transactions.”

Source: (CIAT, IOTA, IMF, OECD, 2021^[37])

In ISORA 2020, half of the 156 participating tax administrations reported that they used APIs in 2019. (ADB, CIAT, IMF, IOTA, OECD, 2021^[22]) Consequently, there is ample opportunity to seek advice from other administrations in this area.

To truly digitalise tax administration processes involves much more than producing electronic equivalents of paper forms; ideally digitalisation opens for interaction between the taxpayers’ ICT systems and the administration’s ICT systems, and a demonstrated successful method of such interaction is through APIs.

Recommendations for APIS include that

- The data transfer should occur at transaction time, not at predefined times;
- The data should be automatically validated on receipt, and the sender should receive notification for correct as well as incorrect data transfer;
- All necessary data, but no other data, should be transferred;
- The transfer can go both ways as needed.

As noted in the definition above, there are significant advantages to using APIs in the interaction between the tax administration and businesses. The disadvantages, which include higher risks of fraud and data theft, arguably come with any form of electronic interaction between the tax administration and other entities.

The administration may choose to use APIs for interaction with both private and public entities. This may for instance include solutions for business taxpayers to send PAYE data, for third parties to send tax-related data, and for other public institutions to send and receive taxpayer data.

APIs can also be used internally between the ICT systems of large administrations. There is usually need for interaction between the systems, and sometimes central components providing for instance security services can be used by many other systems. Such central components may use APIs for communication. Likewise, by using APIs for communication between components of the tax ICT architecture, one component can more easily be replaced, with less impact on other components.

There are various protocols and formats to choose from when building APIs at any point in time; the chief architect for the digitalisation project should make a thorough review of available options and make choices that will allow the administration to use the APIs for a long time, with continuous adaptations as necessary. One of the factors to consider in this review would be what protocols and formats, if any, are currently in use within the public sector and in the public-private sector interaction of the jurisdiction.

Further information on API usage in tax administrations, including the two common conceptual architecture models of APIs, peer-to-peer and client-server, can be found in (OECD, 2019^[59]).

Minimum Viable Product (MVP)

Regardless of the size of the ICT budget for the digitalisation project, the tax administration will have to prioritise software functionality, and there are different ways of choosing what to include in each software delivery – and possibly what to exclude entirely – whether the software is being developed, bought or rented. When buying or renting software, the administration may not have much say about functionality other than on a high level. In software development however, it has become more common to use the Minimum Viable Product concept in order to only develop the most important functionality.

The concept is based on the assumption that allowing users to start using a component as early as possible, with the minimum functionality needed to actually use it, will give the best possible foundation for later completing the component with exactly the functionality that the users need. Feedback from the MVP component users will narrow the focus of subsequent additions and changes to the component to the most vital areas. Needless to say, the concept also requires an iterative approach where the same software component may be re-developed or extended several times.

For instance, a tax administration developing a smartphone app for registering small companies may determine that the MVP version will only include company identification, company name, contact person and area of business. After the app has been launched and used briefly, other information fields will be added. The initial usage may uncover the need for information fields that were not considered during the initial development, and similarly information that was assumed to be important at the outset may turn out to be unnecessary.

This concept has proven to work well in tax administration for many cases. For instance, it shortens the time from requirements to ready product, which helps increasing motivation for all involved, and the cost of failure if the product turns out to be missing the mark is lower. A third advantage is that the method drastically reduces the probability of the software component including functionality that is not actually needed.

However, users in some tax administrations have discovered that the MVP concept has become their enemy rather than their friend: If they approve a specification of minimum functionality component to be

developed and launched, they later discover that there is no budget to complete the functionality to a level where the component can actually be productive; they end up with a system where many components are only developed to MVP level, bordering on useless due to limited functionality.

Tax administrations considering using the MVP concept are therefore advised to ensure that the budget and scope are aligned to allow for completing all components initially built as minimum viable products, since for instance 10 well-functioning components are likely to serve the administration much better than 15 partially completed MVP components.



Supporting the Digitalisation of Developing Country Tax Administrations

This report has been produced by the OECD Centre for Tax Policy and Administration in collaboration with the African Tax Administration Forum (ATAF). The primary purpose of the report is to share information that will assist developing country tax administrations as they consider digitalisation, facilitate dialogue among tax officials on tax administration issues, and identify opportunities to improve tax administration ICT systems.

The report examines the common elements of successful digitalisation journeys, and the benefits they deliver. It is not intended as a 'how to' guide, as the individual circumstances of an administration should dictate the most appropriate solutions and approaches. Instead, it uses insight and examples supplied by tax administrations to highlight important success factors, recent innovations, examples of good practice, and key learning.



For more information:



fta@OECD.org



<https://oe.cd/fta>



[@OECDtax](https://twitter.com/OECDtax)



[OECD Tax](https://www.linkedin.com/company/OECD-Tax)