IMPACT OF DIGITALISATION

ON THE TRANSFORMATION OF TAX ADMINISTRATIONS

IOTA
Intra-European Organisation of Tax Administrations

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FOREWORD

Dear Readers,

Once again it is with great enthusiasm that I come before you with another publication, this time directly resulting from the professional theme addressed during the recent 22nd General Assembly of IOTA, hosted by the Slovak Presidency and dedicated to the "Impact of Digitalisation on the Transformation of Tax Administrations".

During two full days, participants in the technical session of the General Assembly had the opportunity to debate - in both plenary and break-out sessions - the changes that our tax administrations are going through in this *Digital* era. We talked about reinventing our institutions, modernising our internal processes and improving the relations with our taxpayers and partners.

We also offered the attendees of the General Assembly an exhibition showcasing digital transformation initiatives in a tax administration context, allowing our member tax administrations to see at first hand the innovative projects and tools that are already being used, including cutting-edge technological solutions such as data analytics models, electronic invoicing, online services, machine learning and VAT risk management.

The beauty of this publication is that it captures the knowledge and practical experiences shared during the 22nd General Assembly of IOTA and extends it to the whole IOTA family and beyond, demonstrating why we have a very specific role to play in the international tax community.

I trust this edition will help you to navigate the *tax Digital wave* with more confidence and precision. Enjoy the reading!

Miguel Silva Pinto
EXECUTIVE SECRETARY

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TAX ADMINISTRATION IN THE DIGITAL ERA

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Think digitally, act meaningfully – Digital transformation in Estonia

Valdur Laid

Director General of the Estonian Tax and Customs Board

Introduction

With a limited workforce and scarce mineral resources, Estonia is always searching for new solutions to get things done cheaper and faster. We have built an efficient, secure, and transparent digital ecosystem that saves time and money. With a 96% share of eGovernment users, Estonia is the highest performer in Europe and we are proud to be among the top five in Europe in using pre-filled forms, online service completion and the range of digital services available for businesses. More than 99% of tax reporting in Estonia is done digitally and it takes three clicks and 30 seconds to file your income tax return from wherever you are in the world.

In this article, based on Estonia's experience I shall focus on three key points that underline why digitalisation is such a critical topic for tax administrations as well as for public services and states in general.

First, let me point out the inevitability of outside-in customer-centric and service- oriented thinking. The public sector and its services, including tax collection, should be available and provide an excellent experience for people and businesses wherever they are and whenever needed. Therefore, taxpayers expect that they are able to handle their affairs online, hassle-free. As studies have shown there is a direct correlation between comfortable, easy services with great user experience and voluntary tax compliance, the latter being an ultimate goal for all the tax authorities.

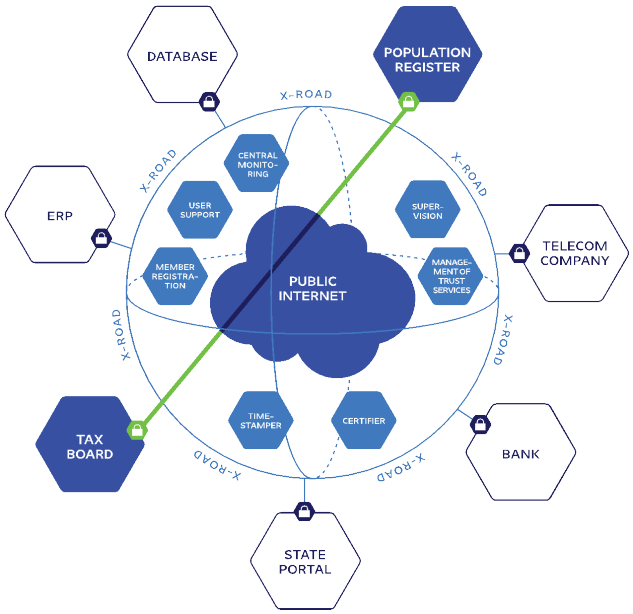
The second keyword is efficiency. One way or the other – tax administrations are struggling with resource limitations that makes it difficult for us to reach our goals and adapt to the continuously changing environment. Digitalisation requires resources during the development phase; however, it also guarantees significant cost saving and efficiency. In Estonia, the tax and customs administrations are a joint authority with roughly 1300 officials. It costs 37 Euro cents to collect 100 Euros for the Estonian government. The collection cost is one of the lowest among the OECD countries. To deliver the savings through digitalisation, it is vital not only to simply automate existing declarations and decades-old processes but to thoroughly analyse the possibilities to redesign the services from scratch. That would also ensure the best user experience and hence, the biggest possible savings for the whole society as the effectiveness should not only benefit the tax administration but also the taxpayers using the digitalised services. Efficiency for a tax authority and excellent taxpayer experience go hand in hand.

Three efficiency examples from Estonia:

1. ID-card allowing nationwide digital authentication and digital signing of documents

2. The X-road, integrating (machine-to-machine) different government and private databases, leading the way to data-only-once principle

3. Data-only-once principle whereby different public services may only once ask the same data from the citizen.



Thirdly, competitiveness. As we all know - the world is globalising and digitalising rapidly which in return influences how and where people live and work and how taxes are collected. Countries are inevitably competing for the present and future digital nomads who work and pay taxes in a very different way than the tax authorities are used to. Trusted, exchangeable value has already been created by the cryptocurrencies. They challenge the states' monopoly to issue money. In the future companies and people will choose their place of business and work where simple and convenient public and private digital services are offered. This is pro-actively addressed by the Estonian government's e-residency programme that allows for the people who have been granted the Estonian e-residency to use public digital services and the robust legal framework offered by Estonia no matter where the e-residents live. In 2014, Estonia became the first and still is the only country in the world to establish e-residency. e-Residency is perfect for small businesses, freelancers and entrepreneurs. People from 150 countries have applied for Estonian e-Residency; there are 40,000+ residents to date (since 2014), and 6,600+ companies are owned by e-residents in different economic fields.

Conclusion

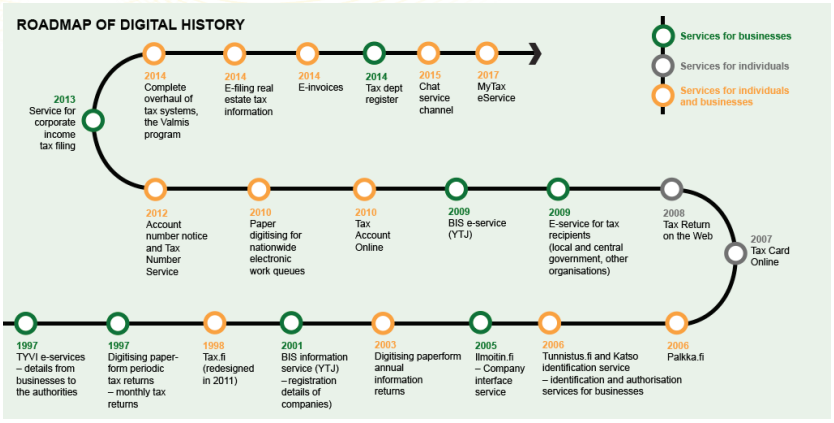
The journey of digital transformation is just in the beginning for all of us. I would like to point out one key lesson that Estonia has learned – digitalisation needs scale and impact. Quite often we see institutions developing their own small digital silo services but in order to have a meaningful impact one needs to focus on the turnkey building blocks that would have the biggest impact (influence) for your respective institutions or even for the country as a whole and then create a meaningful roadmap for digital transformation.

Digital transformation challenges and possible solutions through international cooperation

Markku Heikura

Director General of the Finnish Tax Administration

Digitalisation of the tax administration in Finland started back in the 1960s, and it has been an ongoing process ever since. For us, digitalisation is not a series of IT projects but rather a process of streamlining our activities in order for us to do better.



Even if we draw charts of our major service launches to better communicate the path we have been on for a long time, I do not see digitalisation as a series of individual IT projects. We see it as a way of doing things more efficiently and effectively as a whole, changing our processes, serving our customers better.

As late as the 1990's we focused on checking tax returns with then state-of-the-art calculators and writing down the results with pencils. Nowadays, we have about thirty calculators in our museum collection, and in principle, all of our work is done online in paperless offices.

Small tax gap and high compliance are signals of our success

Digital services as such do not add value, if the processes in the background are not simultaneously developed. In my opinion, digitalisation and service design also require thorough and deep understanding of business activities. This is necessary in order to bring the taxpayers – or customers, as we like to say – and the customer processes to the core of it all.

I believe the small tax gap and high tax compliance in Finland are the most significant signals of our success. The VAT tax gap in Finland is about 5-7 %, and we have recently begun analysing the corporate income tax gap in cooperation with the IMF.

At the same time, 79% of Finns are happy to pay taxes, and a large part would happily pay even more if they were able to earmark their taxes for a certain purpose like schools or health care.

A few examples of our development success stories

In Finland, individual taxpayers do not need to fill out a tax declaration. The tax administration receives most of the information needed directly from third parties such as employers, banks and Insurance companies. Based on the information we receive, we prepare a pre-filled tax return for everyone.

Nowadays, the information we receive from third parties has such a wide coverage that the pre-completed tax return is, in fact, the final tax decision for 80% of the individual taxpayers.

As for the 1.5 million people who need to revise their pre-filled tax return at all, 60% do it online. Of those aged between 25 and 40, more than 80% revise their tax returns online. The numbers have risen significantly in the past ten years. Furthermore, from 2019 onwards it is possible for us, the tax administration, to send out the pre-completed tax return electronically instead of paper mail.

In recent years, the emphasis of our development work has moved to corporate taxpayers. One of our key goals is to reduce the administrative burden they face.

As of now, the use of e-services in taxation is compulsory for businesses in Finland. We receive a large part of the information about VAT and other self-assessed taxes directly from the financial administration systems of companies. Only a small number of the smallest companies still uses the electronic forms we provide.

In active cooperation with the companies, we have created different interface solutions. Recently, we have also created Application Programming Interfaces (API). In the future, we hope to see information on taxation moving to taxpayers or accountancy firms through API's. With API's, third parties are able to develop services for handling tax matters more efficiently.

Our joint work with the corporate world is central to our service development. We are currently involved in a project, where the jointly stated goal is to digitalise the housing market in Finland. As 95% of the housing market is realised through commercial banks, they are also involved in this ambitious project, as are real estate companies.

The system of trade the project develops is based on blockchain technology (Corda). With this technology, we can ensure we always receive information about real estate purchases and see that taxes are paid when due. The technology also ensures transparency. Purchasing a home has been made easy by making the real estate process digital, with all obligations automated. The project is an excellent example of what tax administrations can gain from integrating with corporate ecosystems.

We are also trying out "robotic process automation" (RPA) tools and chatbots based on artificial intelligence. Through the robots, we are able to automate routine work. I also see a lot of room for cooperation between public sector organisations, and think we have more to win, if we work together.

Our chatbot, jointly developed with the Finnish Immigration Service, is currently in the pilot phase. When a customer starts chatting with the Immigration Service chatbot, and the bot notices the issue deals with taxation, the chatbot automatically guides and noticeably moves the customer to the Tax Administration. The customer will notice the transition, as background colours and name of the chat changes.

In addition to piloting with chatbots, we are also investigating how artificial intelligence (AI) could support real-time customer service. AI might be able to recognise the taxpayer's problem and help the tax clerk by giving them ready-made solutions appropriate for the situation.

Digitalization challenges tax administrations in ways we did not necessarily see happening ten years ago

The rise of the platform economy and new business models may put us in situations where we do not have access to the data we need in order to do our job – to secure tax revenues due to our countries.

The business models are complicated, and examples range from traditional, seller-buyer model, to models that include several different level platforms in which buyers, sellers and suppliers operate together.

One of the key features of the digital economy is information being centralised on a few international platforms. At the same time, income from services and great turnover in electronic trade are sporadic. Virtual currencies are used outside traditional structures.

When we link the platform economy to new means of payment, we might end up in situations where monetary transactions take place outside Finland or even outside Europe. One can make transactions on several platforms and the payments stay on the platform, forming a sort of internal currency within the platform. If no actual transaction takes place, it will be difficult to trace and to tax.

Therefore, securing the information base for taxation, access to data, is the central challenge for tax administrations globally. Business transactions do not respect national borders. We can address the issue much better if we work together to e.g. advance the international exchange of information to meet the requirements of the digital era.

If 10% of the individual tax revenue income currently collected in Finland moves to platforms, and we no longer receive the necessary information or have access to data, the tax shortfall for our national budget could be as much as a staggering €2.7 billion.

Smart contracts and data could be the best way to meet the challenges

Tax administrations need the information from digital players to ensure not only effective control but also smooth service. We should be able to ask for and collect information. In this case, we need access to mass-level data. It is good to note this makes it easier for the taxpayers; the information could already be on the pre-filled tax return, making any declarations to the tax administration unnecessary.

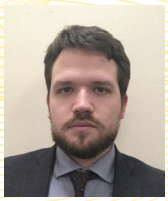
Blockchain technology combined with smart contracts with platforms could enable transaction-based taxation in real-time. Taxes could be paid automatically without the taxpayer's input. Similar technology could also be the answer for developing the exchange of information between tax administrations.

To better identify the taxpayers' needs and improve efficiency, we need to use big data analytics. And in order to achieve the best results in meeting the challenges of the digital era, international cooperation with IOTA, OECD, EU, and other actors is vitally important.

Tax administration in the digital era: the FTS of Russia approach

Dmitry Volvach

Head of Directorate for International Cooperation and Capital Movement Control, Federal Tax Service of Russia (FTS)



Maxim Solovyev

Deputy Head of International Division, Federal Tax Service of Russia (FTS)

Keeping up with the digital era

It is no news that digital technologies are influencing the world faster than we could imagine. The environment we operate in is constantly evolving. Tax administrations have no choice but to adapt and respond to these changes by undergoing digital transformation.

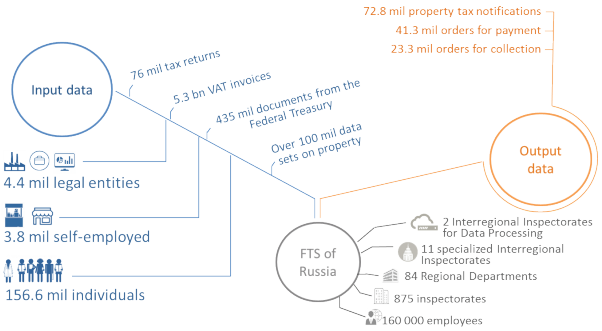
Undoubtedly, digitisation and growing connectivity facilitates exponential development of new solutions and business models that create new challenges for tax administrations. But going digital is not only a challenge, it is an unprecedented opportunity. Innovative solutions can help tax administrations function more efficiently. For instance, digitisation offers new ways of interacting with taxpayers by allowing administrations to harness data to offer customers new proactive services. Moreover, digitisation makes administrations more agile in their compliance activity, boosting their performance.

In the new digital era data and knowledge will be the most valuable asset. Digitisation means that tax administrations will have to deal with ever-increasing amounts of structured and unstructured data coming from a vast number of new sources. With so many new flows of information about the taxpayers, tax authorities are basically becoming data agencies of the government. Their goal is to learn how to effectively handle and apply this Big Data in compliance and service activities. In order not to lose control tax administrations should lead this process and shape the surrounding environment to fit their needs.

Harnessing the raw data

To illustrate this point here is a few numbers. Today the FTS of Russia deals with over 4 million legal entities and over 155 million individuals. Every year the tax authorities receive over 75 million tax returns and over 5.3 billion electronic invoices. And these numbers only tend to increase.

Some time ago we looked at the vast data sets that we have access to and realised that this opens up new opportunities. It became clear that the ability to process and analyse data would soon allow us to shift to e-assessment without involving taxpayers. In the past it took tax administrations months and even years to do post-filing. Using Big Data we could start working towards real time e-audits. Real time data monitoring reduces the amount of information that we would typically ask a taxpayer to file during a tax audit. Big Data analytics is facilitating more targeted tax audits.



We did not want to wait for data flows to emerge and flow towards us. We decided to use technology to form our own data flows that can help tax administrations.

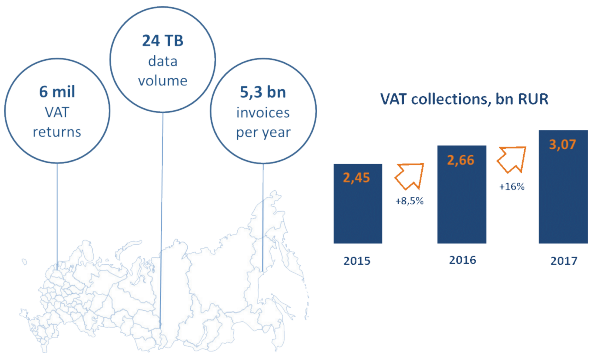
The precondition for implementation of the new IT system was the construction of two Data Centers. They are built according to the most state-of-the-art requirements and capable of sustaining the workload that we need to perform our tax administration functions. The Data Centers created the opportunity to centralize taxpayer files and start handling big data. This opened the way to exciting new projects and initiatives.

Putting a cap on VAT

One of the top priorities for us was to develop approaches to addressing the issue of VAT fraud. This was a significant source of budget loss and non-compliance. The challenge was to put a digital cap on the whole economy and start matching transactions.

The legislation was changed to require full mandatory e-filing of VAT tax returns, VAT invoices and primary

ledgers. That includes all data on transactions in the economy arriving to the FTS in digital form. The key was to develop taxpayers' VAT risk assessment profiles that completely cover all taxpayers with electronic VAT audits.



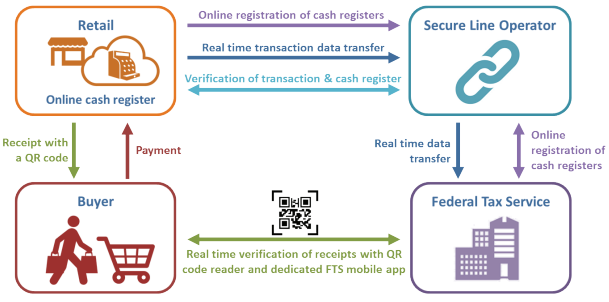
Our VAT cross-matching system automatically identifies risks, requests taxpayers' clarifications and generates requests for explanations of discrepancies. It also automatically assigns tax audit cases to tax inspectors and benchmarks their performance. It is also capable of measuring performance efficiency of each inspectorate office or regional office of the FTS across the country.

As a result the number of high-risk VAT refund claims has dropped 7 times, the VAT tax gap has decreased to less than 0,6% and the VAT revenue has been growing despite the uneven world economic development.

Getting a snapshot of the retail sector

Online cash registers is another project the FTS has been working on. It was started in 2014 with a small pilot in 4 regions. By July 2017 it became mandatory for all retailers except small businesses to install online cash registers. By 2019 we expect to have full coverage of the country.

This means that tax authorities will have full data on all retail sales of goods and services in the country. The system allows us to break down this data by region or by sector, or by retail chain; it allows us to see income of a particular store or zoom in on each and every checkout register in the country. This allows us to see who actually sold what, where and at which price and see anomalies that might indicate non-compliance. This opens new opportunities for analytical work and measuring economic performance indicators in real time on a countrywide scale.



The system helps to address the issues of combating the shadow economy by increasing business transparency, facilitating a healthier business environment and encouraging competition. Owners and employers also find benefits because it enables them to address employee fraud.

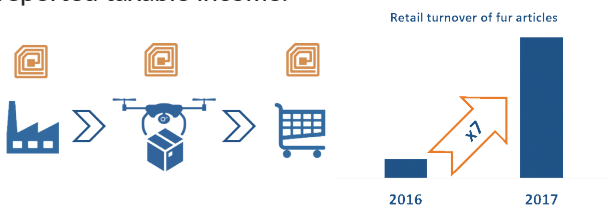
Tracking the movement of goods

Another important element of our digital environment is the tagging system based on RFID technology. The system was first introduced in August 2016 as a pilot project to monitor movement of items made of fur from manufactures and importers all the way to final consumers.

The sale of untagged fur items was made illegal. All manufacturers, importers, middlemen, distributors and retailers must report the movement of goods to the system that was developed and implemented by the FTS. The data is arriving in real time, which hinders circulation of smuggled and counterfeit products.

For the first 8 months of the pilot retail sales of fur coats in Russia increased 8 times compared to the entire year 2015. About 25% of retailers have left the shadow economy and registered themselves as sellers of fur coats.

The government sees this as a big success in addressing the issues of the shadow economy. The project has now been extended to cover the pharmaceuticals sector, which is affected by supply of counterfeit medicine and violation of controlled price mechanisms on certain medical drug items sold by pharmacies. There are also plans to include clothing items into the system to address issues of smuggling and counterfeit goods. This will allow for better market transparency and more reported taxable income.



Monitoring of financial revenue flows from retail sales of goods and services combined with information about actual movement of goods and performed VAT transactions creates better opportunities for monitoring compliance.

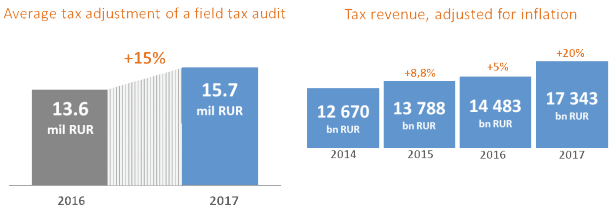
These data flows produce Big Data that create exciting opportunities for further analysis. We probably cannot even imagine what kind of analytics and results we might discover using this data in the future but most certainly these systems are taking us closer to automatic preparation of tax returns for corporate taxpayers and the introduction of wide no-filing mechanisms.

Boosting performance

These three initiatives are just the tip of the iceberg. The FTS has also achieved groundbreaking results in providing e-services: over 80 million people visited the FTS web portal in 2017, and over 30 million are currently users of the Personal Online Taxpayer Account. New functions and powers received by the FTS, such as administering social insurance contributions and maintaining the nationwide population register, are significantly expanding our capabilities in terms of data analytics and tax administration efficiency.

With the help of digital tools we were able to achieve impressive performance indicators. Despite the fact that statutory tax rates in Russia have remained unchanged since 2009, tax revenue has been demonstrating a stable growth, outperforming the nation's GDP. In 2017 the FTS collected 20% more tax revenue than in 2016. We have also drastically boosted the efficiency of our compliance activities, cut down the number of tax appeals and are better at handling bankruptcy proceedings. Meanwhile the level of customer satisfaction is close to 99%.

There is no doubt that by introducing and effectively using digital solutions the FTS of Russia can be more efficient in fulfilling our mission which lies in ensuring transparency and ease of doing business, respecting taxpayers' rights and interests, thus forming the financial backbone of the nation through efficient compliance activity and high-quality services.



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Tax administrations are closing in on the bifurcation point. The decisions they make in the area of technology will change the scene of tax administration as we know it. To be effective in what they do, tax administrations should stay on top of this technological race and make sure that they have access to new digital data flows. This is the only way for revenue bodies to keep their connection to the new reality and to respond to the challenges of the new economy.

Embracing digital transformation the HMRC way

Antony Collard

Operations Director - HMRC Digital, Her Majesty's Revenue & Customs, United Kingdom

Introduction

HM Revenue and Customs (HMRC) began its digital transformation journey in 2013, with the aim of being one of the most digitally advanced tax authorities in the world. Using digital technology to achieve our priorities of maximising revenues, bearing down on tax evasion and avoidance from the dishonest minority, transforming tax and payments for customers.

We have embraced digital technologies delivering a range of opportunities for both HMRC and its customers by:

- reducing the administration costs of a number of tax regimes and by making it easier for our customers to fulfil their obligations. We are doing this by creating flexible, modern platforms, with comprehensive multi-channel digital services to allow customers to access the information and get the support they need when interacting with HMRC online.
- enabling our 63,000 people to work in locations across the UK with modern digital infrastructures, so they have the right tools and skills to deliver a professional, efficient and engaged customer service. HMRC teams deal with a range of work from criminal investigations to providing support to the 'digitally excluded' to fill in their tax returns.
- using the data we hold to give a better customer experience, improve our compliance activities, and identify areas where we can target our compliance resources more effectively by undertaking real time risking, transforming processes and capability in order to be more flexible, to direct our skilled resources to tackle the highest tax risks.

Digital Journey

We have made significant progress in the last five years, and are now recognised as one of the UK's most digital businesses with more than 9 out of 10 customer transactions handled online. As the technology and digital industry evolves, so will our digital journey.

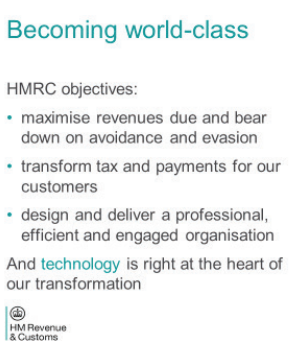
Our digital journey started as part of a wider cross Government initiative on digital in the UK. A team of just 20 people built our first three digital exemplar services.

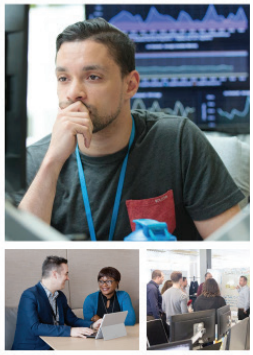
HMRC now has well over a thousand specialists working on digital services in seven state-of-the-art digital centres around the UK. We have built our own platform infrastructure Multichannel Digital Tax Platform (MDTP) using open source technology, hosted in the Cloud, that supports over 146 digital services, a suite of online forms, and our own Mobile App that receives more than a million visits each month. The number of digital services continues to grow, and make a difference, and customers are increasingly choosing to interact with HMRC online as the figures below from 2018 highlight:

- 92.8% of Income Tax Self Assessment returns were filed online
- 47% of tax credit renewals (applications for lower income subsidies) were made online
- 16m individuals are now using their Personal Tax Account to declare their tax liabilities and monitor their tax payments.

Engagement Strategy

We launched a Personal Tax Account for individual customers in December 2015. The Personal Tax Account is a safe and secure place for customers to check, update and manage their tax information that HMRC holds, in one place. It now has more than 16 million users and is continuing to grow daily as we encourage customers



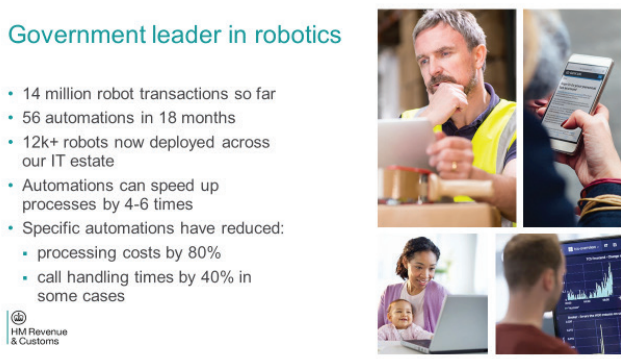


to move to online channels. Customers can access their data securely, make payments for amounts due, and check what has already been paid.

In addition to digitising our existing processes, we are also looking wider, doing broad user research with our customers to identify their needs and building those into the services we create. The online process is enabling our customers to get real time certainty on their tax liabilities and we have ensured that their feedback has influenced the design and functionality of the Personal Tax Account.

As our digital services advance, the customer benefits have increased including faster, more direct access to information and services, which are accessible on any digital device at any time of day. HMRC's performance statistics show that customers are satisfied with the digital services on offer and in July 2018, more than 82% of customers were either 'satisfied' or 'very satisfied' with our digital services. Moving to a 'digital first' model means that the shift in customers accessing information has helped reduce the pressure on the telephone helplines. There were over four million calls to HMRC in July 2018, so there is still a need for our dedicated phone lines. It took customer services teams on average 4:47 minutes to answer customers' calls in July 2018.

We have a world leading Application Programming Interface (API) strategy that, in a secure environment, allows external organisations both within and outside government to access, change and submit data to us. We have built dozens of APIs, surfaced externally through our API Platform, and this strategy is a key part of our Making Tax Digital programme. In order to support this, we have also created a number of authentication and security controls to ensure that our customer's data is safe and only accessed by those who are authorised to access the information. Our API platform has already had over 200 million transactions to date and continues to grow, and we are seeing our strategy bring innovation to the tax software marketplace. We are working with more than 120 software developers in our API pilots, and this supports our customers getting a bigger range of more sophisticated commercial tax software products to choose from. For HMRC this is helping improve compliance.



Not only are we transforming digital services to improve customer journeys, but HMRC is using automation technologies to transform the way our staff work. Robotics and artificial intelligence help us to deliver efficient and effective services. The 'robots' are pieces of software that can carry out a task in a similar way to how a human would - that's important because it means a process can be automated without having to make significant changes to the underlying IT architecture. They remove tedious and repetitive tasks and free up colleagues for the more customer-facing aspects of their roles. For example, for those working in contact centres, 'robots' help pull customer information from a range of internal systems, together on one easy to read dashboard. It provides an efficient, streamlined and user-friendly service. So far we've deployed more than 56 robotic automations across our IT estate, and exceeded 14 million transactions processed by robots.

We are equipping our staff with the technology they need to work and communicate in the most effective way, by providing them with the technology required to work in a modern environment, work collaboratively to improve services and have a professionally engaged organisation.

Cyber Security

Investing in innovative technology and systems does come with a health warning. HMRC is the most spoofed government brand. From fake phone calls to websites, fraudsters and criminals remain persistent in their attempts to scam taxpayers into paying large sums of money that they do not have to pay. HMRC's cyber security team is actively working to close down and disrupt this criminal activity by:

- successfully deploying technical controls that have stopped 450 million phishing emails from ever reaching our customers' inboxes
- delivering an innovative pilot that has reduced the number of reported instances of HMRC-branded phone text phishing (SMiShing) by 90%
- initiating the removal of more than 16,000 malicious websites in the last year alone, meaning even if the texts are delivered, the associated phishing website is likely to have been removed
- using Transaction Monitoring to pick up fraud patterns in the use of our online services in real time, allowing us to intervene when we have a suspect interaction, or pass it to an operative to deal with as an exception.

Conclusion

We are now five years in to our digital journey and, as highlighted, we have progressed a long way in that time. The digital technologies introduced have made a difference in the way we work and engage with our customers. We will continue to drive our Digital Strategy, by being realistic about the challenges of ongoing digital transformation and its complexities. However the journey does not end there, we will also continue to exploit new and emerging technologies, and collaborate and invest in new initiatives to improve the level of service we provide to our customers.

Digital transformation in Italy: between past and future

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Introduction

The Italian Revenue Agency (Agenzia delle Entrate) has developed over the last 20 years a consolidated information technology system and has recently begun another important technological "revolution". The digital transformation affecting the Italian Revenue Agency has two main dimensions: (i) e-services to taxpayers and (ii) use of Big Data for risk analysis and tax compliance.

Digital services make taxpayers' compliance easier and more effective; at the same time a data-driven strategy enables the Tax Administration to meet current and future strategic goals.

E-services to taxpayers

On the e-services side, the innovative path undertaken by the Italian Revenue Agency aims at simplifying taxpayers' life as much as possible, by enabling businesses and individuals to fulfill their tax obligations with "a few clicks", ensuring personal data protection and maximisation of tax revenue.

Online filing of income tax returns and digital tax services accessible both from the web and from mobile apps are already a consolidated reality and have been perceived by the "customers" as success stories.

The Italian system for the online filing of income tax returns is designed to allow the complete dematerialisation of tax compliance and is robust enough to handle peaks. The Italian Revenue Agency receives on the due dates approximately 2 millions of tax returns out of which about 200 thousand are acquired on that day in just 2 hours. These figures include e-filing of tax returns and on-line tax payments (F24 form) and include also filing and payments made through intermediaries.

Within the wide range of *e-services* already available to taxpayers, it is worth mentioning online access to a personal "digital tax account", online access to real-estate data (linked with the online inheritance tax return), online filing registration of leases (including an all-inclusive coupon tax), and online assistance on request.

Major investments have also been made on the implementation of a system of ***pre-filled tax returns***. The Italian Revenue Agency first released pre-filled PIT tax returns in 2015 (Fiscal Year 2014); since then the system has been significantly improved. For the Fiscal Year 2017, new data on tax deductions (such as the fees paid for kindergartens and donations made to charities and other eligible NGOs) were acquired and included in the pre-filled form, and a new procedure has been developed to assist taxpayers in modifying and integrating pre-filled PIT tax returns. In particular, taxpayers can verify the documents concerning their individual expenses held by the Agency directly on the web and, if necessary, supplement or modify them. The procedure automatically applies the tax deduction rules and fills in the relevant fields of the tax return form accordingly. As a consequence of the new procedure, the administrative process is leaner, since the formal checks previously performed by the Revenue Agency to integrate or amend the documents received are no longer necessary.

The development of a system of pre-filled tax returns has also made it possible to offer new services to taxpayers, such as the possibility to have all healthcare expenses incurred (pharmaceutical, hospital, professional services and others) available directly online. In addition to the advantages in terms of reduction of controls on the documents submitted by taxpayers, the introduction of the pre-filled tax return has led to greater awareness by taxpayers as regards the categories of deductible expenses. It is no coincidence that since 2015 there has been an increase in the frequency and amounts of deductions reported in the PIT tax return (730 form).

Another important pillar of the Agency's innovation strategy in the domain of taxpayers' services is the implementation of ***e-invoicing***, started in 2014/15 to manage mandatory B2G electronic invoicing.

Electronic invoicing is an opportunity for taxpayers both in terms of cost reduction and of streamlined accounting of the activities they carry out.

Building on the experience acquired over the last 3 years on electronic invoicing to public administrations (B2G), Italy has decided to broaden the scope of mandatory e-invoicing.

In particular, with the aim to counteract VAT fraud and evasion more effectively and, in the long-term, to digitalise the whole process of order flow, Italy is the first European Member State to obtain a derogation from the VAT EU Directive 112/2006 to use mandatory e-invoicing. The process of implementing mandatory B2B and B2C e-invoicing is on the way as it will be in force as from 1 January 2019. Mandatory e-invoicing will allow the Italian Tax Administration to acquire real-time data, enhancing risk analysis to detect and prevent frauds as well as the compliance and services to taxpayers.

In connection with the implantation of mandatory e-invoices, the Agency has developed and released a range of free services available to all VAT operators, including:

- a web procedure and an App for the preparation and transmission of electronic invoices;
- an IT procedure for the preparation of electronic invoices without a web connection;
- a service for the generation of a QR-Code, available to all taxpayers holding a VAT number, which allows VAT persons to acquire "automatically" the identification data of the supplier;
- a service of pre-registration of the electronic address where taxpayers consent to receive by default all invoices;
- a service of storage - valid for tax, civil and criminal obligations- of invoices issued and received via SdI (the exchange system - Sistema di Interscambio for the processing of e-Invoices).

Mandatory e-invoicing might also lead to the development of a pre-filled VAT return (on the basis of data obtained from electronic invoices the Revenue Agency should be able to prepare a "draft" of the VAT return).

Overall, the Agency is taking significant steps towards the digitalisation of the services offered to taxpayers. This leads, however, to a new challenge- that is, to ensure more integrated e-services, for example through the development of mobile apps in order to move from consultation to execution.

Data Analytics and related activities

The global economy is constantly changing and it is no surprise that digital transformation is one of the fundamental drivers. The digital economy is undermining the conventional notions of business, interaction between enterprises, services to consumers and the everyday performance of tax administrations. In particular, the spread of digitalisation may require tax administrations to change the way risk analyses and audits are conducted.

Big data and ***data mining analysis*** is another area where the Italian Revenue Agency has started adopting and exploring new approaches: hiring skilled data scientists and developing Advanced Analytics tools is part of this strategy that aims at fostering tax compliance while creating better risk profiles of clusters of taxpayers. The use of data analytics and the related activities aim at mining data to help increase tax collection, target compliance initiatives and improve efficiency. The application of data mining techniques is part of a risk-analysis strategy, focusing on: estimates of individual income (74.6% positivity rate versus 33.9% using traditional techniques); identification of VAT fraud profiles (80% positivity rate); definition of taxpayer profiles based on the financial reports archive.

New ***compliance tools*** have also been developed by exploiting big data. Such compliance tools include compliance letters to taxpayers, i.e. letters where discrepancies between data available to the tax administration and tax returns or tax payments are highlighted in order to nudge taxpayers into autonomously amending their tax behaviour.

More specifically, compliance letters sent to citizens, professionals and businesses are a tool whose purpose is to contact the taxpayers without deploying authoritative powers but offering a service that leverages on tax morale.

There are two types of compliance letters that have been developed so far:

- *reminders*, i.e., letters sent shortly after the deadline for submitting tax return has expired, that alert taxpayers that have failed to submit their tax return by the said deadline, and remind them that they have still time (90 days) to submit the return and to benefit from low penalties;
- *post-filing alerts*, i.e., letters containing reports on probable errors and omissions made in the process of filing the tax return. The letters also explain how errors may me amended through the so called "active repentance" procedure, thus also benefitting from reduced penalties.

This approach is giving positive results, both in terms of changes in taxpayers' behaviour (for the years following the compliance letter), and in terms of recovery of taxes not paid or incorrectly paid. In 2017 almost 1.5 million communications have been sent yielding 1,3 billion Euros of additional taxes paid.

For this programme, the Agency is investing in IT to automate processes as much as possible and reach a wider number of taxpayers. In addition, the Agency is modifying its organisational models in order to redirect the decisions that previously led to the selection of a tax position to be assessed, towards the prior communication to the taxpayer of the data that would have been used to issue an assessment notice. The Agency is also investing in the assistance to taxpayers that receive compliance letters. In particular, taxpayers are offered online assistance tools that can be used at any time of the day, with no need to physically go to the office. Compliance letters might build upon data from different sources, including cross-border data and information received through AEOI. More generally, *data exchanged through AEOI and their effective use* represent a great opportunity for improving the effectiveness of the administrative action.

The huge amounts of data exchanged and, in particular, received, need to be properly analysed and used in an effective way to (i) stimulate and foster tax compliance, while ensuring protection of taxpayers data and to (ii) detect and counteract tax frauds, tax evasion and avoidance through a more targeted risk analysis and tax audit activity.

The Italian Revenue Agency has established a robust and effective practice in the area of matching CRS data with other sources of information in order to stimulate tax compliance or to detect mismatches. Sharing practices and experiences in these areas could help in building new patterns for compliance and control and lead to huge benefits in terms of revenue.

Finally, it might be mentioned that the Agency is currently engaged in the development of the so-called *"synthetic reliability indexes" (ISA)*, which aim at measuring the tax fairness of the taxpayers concerned and replace the so called "sectoral studies". The new tool should encourage the spontaneous emergence of tax bases and stimulate taxpayers to meet their tax obligations and strengthen collaboration between them and the tax authorities. It involves more than 4 million companies and self-employed with annual revenues/fees below 5.16 million euros. Taxpayers captured by the ISA will have at their disposal a specific free software (currently being developed) that will assist them in filing their tax return.

Conclusions and next steps

The Italian Revenue Agency has put in place long-term strategies to implement a fully-fledged digital system, with the contribution of all relevant stakeholders. This strategic approach implies a constant sharing of experiences and an efficient communication not only within the tax administration, but with the business and taxpayers in general.

The challenge ahead is to become more digital and maintain the high competence of our staff in an increasingly technological environment. Addressing this challenge and developing additional new digital tools require significant amounts of skilled human and technological resources. Therefore cooperation with other tax administrations as well as with International and Regional Tax Organisations is key for sharing experiences and practices. In this regard existing differences of capacity amongst tax administrations suggest the need to foster the mutual learning process by promoting appropriate Capacity Building activities.

PUTTING DIGITAL TRANSFORMATION TO WORK

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Using advanced data analytics to predict debt non-payment risks

Hans D'Hondt

President of the Belgian Federal Public Service Finance

Introduction - It's been a long and winding road

In 2001 the Federal Public Service of Finance launched the Business process review in all its administrations. This led to a study on the risk management at the Collection and Recovery Administration. The objective was to prevent big recovery problems. After this reflection, we decided to focus on bankruptcy as it is a major risk of the non-payment of tax debts and we started the development of our first datamining model in 2006.

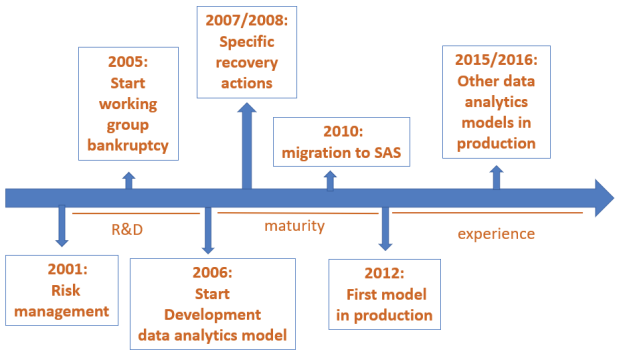


Figure 1 From thinking process to data analytics models: it's been a long and winding road.

In 2007 and 2008, we undertook some specific recovery actions like VAT client listing (making seizures on a client level), but these were not real datamining models but rather indicators which were later used when we developed our predictive models.

In 2010, we migrated to SAS and the datamining development went faster by launching the first model called 'DELPHI' in 2012. Many other models followed between 2015 and 2018.

For our non-compliant taxpayers, a recovery strategy has been developed. We apply a policy of segmentation (based on payment history, ability to pay, etc.) which allows us to apply identical recovery procedures to similar tax debts. This policy is linked with a customer-oriented approach and with a defined set of minimum actions that need to be taken for each debt segment. The segmentation is based on data-analytics.

6 PREDICTIVE MODELS AT THE COLLECTION AND RECOVERY ADMINISTRATION

'DELPHI': PREDICTING INSOLVENCY RISK

1	2	3	4	5
Very high	High	Medium	Low	Very low

'DELPHI' predicts the solvency rate. We have 3 versions in production, one for the companies, one for the self-employed and the last one for individuals. To simplify the work of our colleagues in the operational units, we limited the number of classes to 5 and gave them a related colour. Red for very high risk and at the other end green for very low risk.

'HERMES': PREDICTING PAYMENT BEHAVIOUR EXCLUSIVELY FOR DELPHI RED SCORING

We use this predicitive model to score companies and individuals. 'HERMES' predicts if an individual or company will pay its taxes within 1 year. The population we used to make this model are all physical persons or companies who obtained a very high risk (red colour) in our 'DELPHI' model.

'IRIS': PREDICTING FUTURE PAYMENT RESULTING FROM CALLS

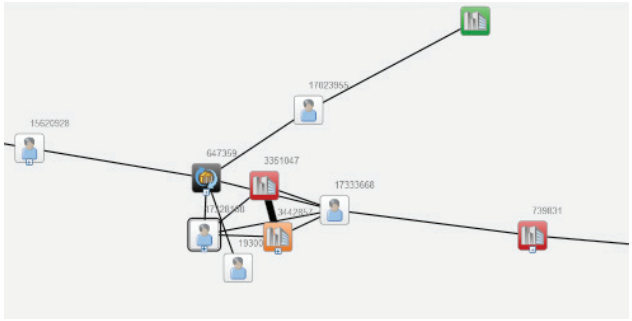
'IRIS' predicts whether or not a person or a company will pay their due taxes within 14 days after having received a phone call from our Debt Relationship Management (DRM) Unit. We also have a version for VAT. Here, we score companies and the self-employed. We also have another version for the withholding tax on income where we only score the companies.

'PEGASUS': FUTURE PAYMENT RESULTING FROM SENDING THE DEBTOR FILE TO THE BAILIFF

In our recovery procedure, the model called 'PEGASUS' is used after the 'IRIS' model. If the taxpayers didn't pay their taxes after a phone call, 'PEGASUS' will predict the likelihood of them paying their due taxes after we send them a bailiff. Pegasus exists in three versions: for VAT taxpayers, for withholding tax on income taxpayers and for personal income taxpayers.

'ARANEO': SOCIAL NETWORK ANALYSIS

'ARANEO' is a specific model that draws a network of connections between companies and legal administrators that create debts by putting companies into insolvency with bankruptcy as a result in most cases.



'ARANEO' is mainly based on the 'DELPHI' scoring giving the fiscal health evolution in time of a company within a network. 'ARANEO' gives us the opportunity to get identify alerts of different networks which we can use in other predictive models.

'PEITHO': PREDICTING INSTALMENT PAYMENT DURATION

Beginning in 2018 we developed a new model 'PEITHO' to predict the appropriate duration of an instalment payment plan. It is now in use in a pre-production phase. The first evaluation of the monitoring of the model is planned for the end of the 2018. In 2019, the PEITHO should be used by all our teams in charge of instalment plans.

THE MAIN ADVANTAGES AND RESULTS OF THE MODELS

We're all facing the challenges of having to do more with less staff. The decrease in staff is a reality, so we must find solutions to deal with it. Data analytics and predictive modelling helped us a lot. The decrease in staff is largely compensated by the increase in efficiency by using the predictive models. The models help our operational staff to better determine their priorities which leads to increased recovered amounts of debts, even with a decrease in staff.

Witholdding tax on income

+ 14,12%

+ 17,65%

	Amount (EUR)	Amount paid (EUR)	% Amount paid	# debts	# debts completly paid	% debts completly paid
	232 226 533	63 890 171	27,51%	87 314	27 314	27,84%
	101 526 783	42 273 056	41,63%	17 268	7 856	45,49%

Figure 2: Results of the IRIS model for withholding tax on income

Above you can see the results of using the 'IRIS' model for the Withheld tax on income. Our Debt Relationship Management (DRM) unit calls taxpayers to urge them to pay their outstanding debt. Since the use of IRIS, the model that predicts which taxpayer will pay after a phone call within 14 days, we have seen an increase in efficiency by targeting those taxpayers that will actually respond. 45,49% pays their debts completely after a phone call, compared to 27,84% of the debtors who didn't get the phone call. This means the telephone call works with these taxpayers. We had a far lower efficiency before the use of the model.

Predicting solvency risk

scoring class	Prediction	% banckruptcy (after 1 year): 31/12/2016	% banckruptcy (after 2 year): 31/12/2017
1	1 613	43,40%	61,19%
2	2 371	32,18%	49,98%
3	2 899	24,18%	40,08%
4	3 959	18,89%	32,48%
5	5 356	13,33%	25,09%
6	7 299	9,37%	18,92%
7	9 861	6,33%	13,36%
8	13 701	4,22%	9,96%
9	21 136	2,61%	6,13%
10	32 492	1,38%	3,59%
11	36 306	0,80%	2,23%
12	46 185	0,59%	1,61%
13	53 680	0,37%	1,01%
14	58 333	0,24%	0,65%
15	56 829	0,14%	0,39%
16	58 302	0,07%	0,20%
17	58 705	0,04%	0,17%
18	47 694	0,10%	0,26%
19	49 810	0,06%	0,13%
20	49 474	0,02%	0,05%
Total	616 005	1,24%	2,53%

+ 58,66 %

Figure 3: Results of the prediction of insolvency risk

In the table above, you can see the percentage of companies filing for bankruptcy after 1 or 2 years and their initial 'DELPHI' scoring. These predictive models clearly make the task of our collection and recovery agents a lot easier by showing them which companies to target first, before they go bankrupt.

RISKS AND BARRIERS TO ADOPTING DATA ANALYTICS TECHNOLOGIES

First of all, you have to convince the non-believers within your administration. Some of the heads of the recovery units were skeptical about a digital tool telling them which action to take towards a debtor, thinking their experience in the field was more valuable in determining the priorities. They have been convinced by the increase of efficiency due to the use of our predictive models.

Privacy is a risk when dealing with data in general, specifically with the General Data Protection Regulation. The GDPR Directive (Directive 2016/679) prohibits processing - and therefore profiling - of citizens without their consent under its art. 22: "The data subject shall have the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her". Our modelling process always includes a 'human' intervention, therefore the decision is not based 'solely' on automated processing and is therefore allowed.

As tax administrations, we can also rely on the exception in art. 6 of the GDPR which states that processing of data is lawful if it is necessary for compliance with a legal obligation (paying taxes) to which the person is subject. The same article provides a second exception which is also applicable on the tax administration. It states that processing of data is lawful if it is necessary for the performance of a task carried out in the public interest. We consider paying taxes a legal obligation and as a tax administration, collecting outstanding debts serves the public interest.

When planning to develop some internal data analytic tools, you need to consider the time that's necessary for the development. It took us years to put our first model into production. You need a lot of Research and Development before launching the model. Trial and error is a part of the process and justified when you look at the outcome and you compare your predictions with the reality. We predict the payments and check afterwards if our predictions were correct and, if not, we adapt our strategy. When the outcome is completely wrong, we learn from that and create a new model. When connecting data, a unique identifier of the debtor is a priority issue. It facilitates building the historical data that we use as indicators for the models and makes it easier to link data between different data sources.

Finally, one needs to consider the limited resources due to the difficulties to recruit data analysts and the implementation of the models by the operational staff.

THE ROAD AHEAD

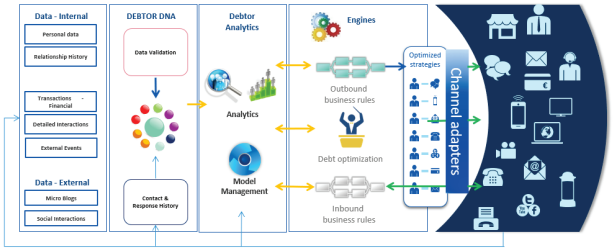


Figure 4 : Strategy factorisation

In the future, we will be running our recovery strategy and our processes like an automated production process in a factory. The Collection and Recovery administration is developing a kind of 'factorisation model' using machine learning techniques to follow the recovery strategy. Once the whole process is automated, the best recovery action will automatically be taken. We want to integrate our recovery actions in our application on a regular basis and possibly create pre-completed letters before the end of 2020. Starting from 2019 we want to automatically select the recovery action which is most efficient and use machine learning techniques. Of course, we will keep up-dating the actual models as some criteria change every year - it's an ongoing business.

Technologically, we're migrating all the datamining tools including the mainframe systems into a new Java development system called Federal Integrated Recovery System and Tax-Refund (F.I.R.S.T.). The deadline is the beginning of 2020. The aim is to have an All-In-One System (AIOS) which will facilitate the digitalisation of the collection and recovery processes and allow the General Administration Collection and Recovery to perform as a shared service centre where we can integrate the datamining. This will make it easier to integrate the models within the work processes.

Since we have a lot of in-house knowledge on developing datamining tools, our Fiscal Administration just started a new programme to enhance our risk analysis. They will be using a profiling model to change the ranking of the risk by focusing on the general behaviour. In the first stage, we will be using internal data.

The French tax administration (DGFiP) at the heart of the Government's digital agenda

Edouard MARCUS

Director of Legal department – DGFiP

Audran LE BARON

Director of Tax management department – DGFiP

Data is obviously a key element for designing and implementing public policies.

Public administrations/agencies gather a lot of information in fulfilling their own duty. However, as such information can be also be used for other purposes, and taking into account the data protection rules, it ought to be shared among such bodies. This contributes on the one hand to reducing the red tape and, on the other hand, to making public policies more efficient and more relevant. In many instances, the tax administration has a special role to play in this respect.

In the particular case of France, every individual has several identification numbers for public policies purposes. Our income tax system is based on about 38 million households. They can include more than one person (for instance a couple). Each of them receives his/her own tax identification number (TIN).

As a consequence, for the purpose of tax collection the French tax administration (DGFiP) is able to identify individuals and to know their home and email address, incomes, real estate properties and movable assets. Consequently, it is a key player in the Government's digital agenda aiming at breaking down the administration/agency silos and making the public sector more efficient. That is the reason why the DGFiP has become a data centraliser.

In this spirit, the DGFiP has been implementing the "Tell us once" approach for more than 15 years to simplify administrative procedures for the user. As an example, data collected for audits is also used to pre-fill the tax returns and, thus, to alleviate the taxpayers' administrative burden.

Furthermore, through many innovative projects, the DGFiP encourages inter-administrations/agencies exchanges in order to deliver better services. To reach that goal, it pays much attention to new IT tools and working methods and constantly tries to take advantage of them.

France Connect

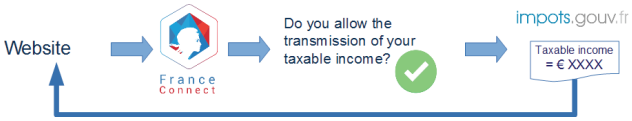
In this respect, among some other recent examples the new service France Connect is a major step. It is about enabling users to connect on any website by using only their own unique tax id/password.

In the context of the French administration, you could compare it for instance to the « Facebook connect » system.

Based on that single identification system, France Connect facilitates exchanges of information between administrations in the context of any online administrative procedure. For example:

1. a user may authorise the administration to automatically obtain information held by another office: the user is exempted from providing it twice.

2. It is possible for instance to send information from one administration to another.



"Hackathon" events

In addition, the DGFiP is particularly proactive in developing digital services for the benefit of both the administration and the user in a 'win-win' approach.

In particular, it sets up events run over several days (called "hackathon") where developers can come together and conceive new computer programmes. For such "hackathons", they work on the DGFiP's data and algorithms on an open database.

Up to now, two "hackathons" have taken place in April 2016 and June 2018. They can be considered as a success, and brought real benefits to the DGFiP.

In April 2016, the DGFiP therefore conducted the #CodeImpot event.

For two days, developers, economists and tax specialists, from the public sector, companies, start-ups and laboratories, worked closely together on tax data and income tax calculation algorithm. They created computer programmess for users or conceived research approaches, for instance to assess the French tax system or its implementation.

In June 2018, the #Datafin "hackathon" was conducted on public finance data. 21 products — finalized or at the prototype stage — were delivered.

Some of them are directly usable by the administration, such as the "Finance Extractor". It is a "3 in 1" file, showing for each State budget section ("mission"), all expenditures, assets, targets and outcomes data sets, on the basis of accounting and Parliament's information material.

Interactive systems as an alternative to face-to-face meetings

Recently, the DGFiP has also tested new systems to accompany users when conducting their online tax return procedure.

Indeed, many taxpayers ask the DGFiP for information during the period when they must file their income tax return (practically, it took place this year from mid-April to early June). In this context, the DGFiP tested a new system that enables taxpayers to interact with a back-up assistance by computer chat. In addition, if a taxpayer has called a DGFiP remote call centre, the tax official there can propose to help him through a co-browsing system.

In such a situation, the official sees the taxpayer's screen and moves the mouse pointer. It can indicate fields or boxes to be completed or amended, but the official cannot perform any of the actions.

Those new interactive assistance offered by the DGFiP were very well received by taxpayers — with a satisfaction rate of 90%.

Conclusions

Turning digital is a real opportunity for IOTA tax administrations. We already took this step, and we must now take advantage of new technologies and working methods.

To be successful in the long-run, the motivation and skills of our administrations' officials will be decisive in finding innovative ideas and to implement and control such systems.

Tax administrations can be an important component of e-government strategies in our countries, and also a decisive player in successfully launching and fostering them.

TRANSFORMING TAXPAYER EXPERIENCE

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Mandatory e-communication - an opportunity to transform taxpayers' experience

Iveta Grossová

Director, Administration of Taxes and Tax Distrain Management, Financial Administration of the Slovak Republic

Introduction

The digitalisation offers benefits for both parties – for taxpayers as well as a tax administration. On one hand, it means improved taxpayers' experience, on the other hand, digitalisation allows us, the tax administrations, to shape internal efficiencies and to speed up our operation. Another benefit is a cost-effective way for compliance.

To enlarge the e-communication is a legal requirement and it requires an appropriate local environment. The most important elements are changes within tax administration from paper to paper-less organization and impact on taxpayers' behaviour. Mandatory e-communication is an opportunity to transform taxpayers' experience. The important question is how to enhance voluntary compliance in order to reduce the tax gap and increase tax collection. Some examples of using mobile applications in this regard are national lottery of electronic cash register receipts, virtual cash register and Alladin - applications that are used by local controls.

Development of e-communication in Slovakia

Mandatory e-communication

We are trying to move from paper to electronic communication. How do we achieve it? The Slovak tax administration has provided opportunity for taxpayers to submit any documents electronically from 2004. Very seldom has it been the case that this opportunity has been accepted by taxpayers voluntarily.

The new period of electronic communication started in January of 2014, when a modern electronic portal was established and the obligation to deliver filings to the Financial Administration by electronic means has been mandatory for value added tax (VAT) compliance: tax return, recapitulative statement - VIES, control statement - VAT invoice listing, any documents, requests, appeals, and financial statements. The obligation has been imposed on a taxable entity who is a payer of value added tax, a tax consultant on behalf of a taxable entity represented by the tax consultant in the process of tax administration, a lawyer on behalf of a taxable entity represented by the lawyer in the process of tax administration, and a representative on behalf of a taxable entity who is a payer of value added tax.

Because the mandatory e-communication for VAT taxpayer was successful and nowadays is considered a common process, we have decided to continue to enlarge the group of taxpayers for whom e-communication will become the norm. In January 2018 in order to encourage taxpayers to adopt e-communication for interactions with the financial administration we have prepared the first pre-filled tax return related to motor vehicle tax. It was delivered to taxpayers only electronically.

% of tax documents submitted electronically (online)	Year					
	2012	2013	2014	2015	2016	2017
Personal income tax	0,8	1,8	9,0	9,1	9,8	10,0
Corporate income tax	12,1	15,1	62,3	64,9	69,4	71,5
Motor vehicles tax return	6,5	25,5	66,4	68,8	71,3	72,4
VAT return	28,7	49,1	99,7	99,9	99,9	99,9
VAT recapitulative statements	99,4	100,0	100,0	100,0	100,0	100,0
VAT control statements	n/a	n/a	100,0	100,0	100,0	100,0
Income tax from dependent activity (employer)	11,1	40,9	75,2	80,7	81,0	83,0
Financial statements	2,7	11,8	57,6	62,0	66,2	68,6

From January 2018 the obligation to file to the Financial Administration by electronic means is mandatory for all business legal entities and from July 2018 for all entrepreneurs – business natural persons. For example in 2012 only 12,1 % corporate income tax returns were submitted electronically, and by 2017 it was 74,4 %.

Electronic cash register

In 1994, The Slovak tax administration introduced the obligation for retailers and entrepreneurs providing certain services to register cash payment via electronic cash register (ECR). It was learn-as-you go for businesses, tax administration and taxpayers. Based on what was learned, a new act was introduced in September 2008. The main objective for tax administration was to further educate entrepreneurs and businesses about

tax compliance and motivate the public to engage the usage of ECR. *Objectives were not met* because not all of the sales were registered appropriately.

There was a need to motivate people to ask for receipts. By selling goods or providing services taxpayers used to ask their customers whether they need a receipt. It is some kind of a pressure to use a word "need" and not the word "want" because of the expected answer from the taxpayers. A common answer was: "I do not need it." The tax administration's objective was to achieve the answer: "I do not need it, but I want it."

In order to involve and motivate citizens in the fight against tax evasion, a National receipt lottery (NRL) was introduced in September of 2013, organized by the TIPOS a.s., a state-owned entity, for operating the state lottery and other gambling games on the basis of individual licenses granted by the Ministry of Finance of the Slovak Republic. Each electronic cash register receipts shall be assigned with the special registration number according to which receipts shall be drawn in the lottery. Registration of the receipts is possible via the internet on the official website, the special application downloaded to personal smart phones and tablets, or automatically in the shops of business partners of TIPOS, via short message service (SMS).

The NRL's first version was organised as a three-round lottery. First round was played every two weeks with the cash prizes ranging from 10 000 EUR to 100 EUR for 10 winners. The Second round - Cash Register Tax Code (CRTS) - was required from each region. The winning receipt with this CRTS won a car. Afterward, this prize was replaced by a cash prize of 10 000 EUR which was later reduced to 5 000 EUR. The Third round was a TV competition with a possibility to win item prizes.

The objectives were achieved. The NRL immediately won a great public interest. During the first week of NRL, the website www.narodnablockovaloteria.sk recorded the Slovak website's traffic record – it had more than 9 million visitors. Also, the NRL's website was the most searched website on Google in 2013.

In the first year of NRL players registered more than 2.5 million cash receipts. The number of unique registrations is currently 705 548 and the total number of registered receipts since the beginning of the NRL is about 194 692 034.

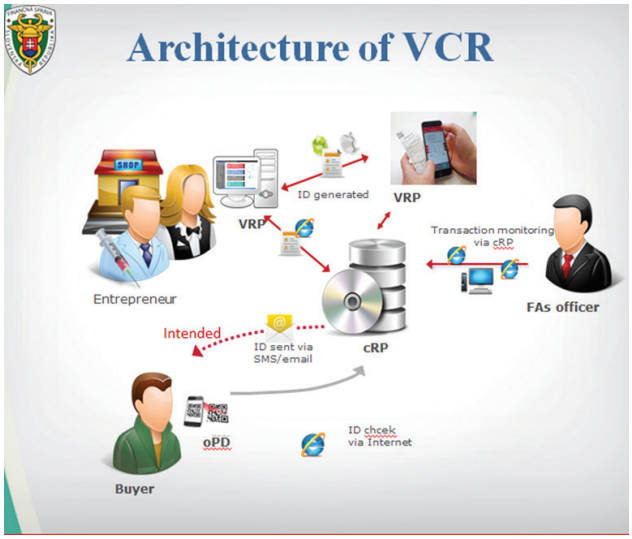
According to the report of the Institute of the Financial Policy SR, after the first year of NRL back in 2014, the VAT contribution to the state budget was approximately 7 - 8 million EUR.

The main non-fiscal benefits are support of tax compliant behaviour of taxpayers, wider anti-tax fraud action, motivations of citizens to ask for cash receipts, strengthening the non-repressive measures to comply with tax obligations and tax education of the general public.

The tax administration receives information about fraudulent behaviour of entrepreneurs like receipts not issued, invalid receipts or fake receipts.

Virtual cash register

In April of 2015 a user-friendly free of charge web and mobile application for the small and medium – sized enterprises - Virtual Cash Register - was introduced and developed by the financial administration of the Slovak Republic. At the beginning, some limitations were in place, such as sectoral focus, number of issued receipts, and only one virtual cash register for the sales point. From September 2017, the usage of the virtual cash register is without any limitations, and everyone is able to use it. Some changes are being made in order for the usage to be more attractive to consumers. We are still developing and modifying the application to meet the consumers' specific requirements - reporting, login via thumb print, recording the type of pay - cash, debit or credit cards, vouchers, etc.



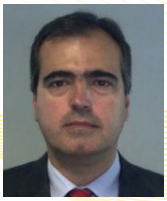
The advantages, in comparison with electronic cash register, are less obligations and requirements for entrepreneurs using VCR as for vendors using ECR, and no or low expenditure for set up (can be run on any supported device – PC, tablet, smartphone with OS Windows, or iOS, Android with connection to the internet). Data is centralised and the financial administration is able to analyse it.

Conclusions:

Our common goal is to promote voluntary tax compliance. We can only achieve this through excellent e-services, for example applications, artificial intelligence or functioning web services which help us to transform the taxpayers' experience.

We are running the national project "Effectiveness of Tax and Customs Administration" within the Operational Programme Effective Public Administration". The reform motto is "more performance, less administration". Part of the target model will be, for example, the introduction of a tax reliability index, the categorisation of entities based on the reliability index and a better service for reliable tax payers with the extension of electronic communication and others.

Simplifying and providing taxpayer assistance - The Portuguese experience



Rui Miguel Candeias Canha

Director of the Department of International Relations Services, Tax and Customs Authority of Portugal

Introduction

The progressive development of information and communication technologies (ICT) that we have been observing in recent years has accelerated the course of digital transformation of the organisations. In the case of the Tax and Customs Authority of Portugal (AT), the digital transformation strategy owes its success mainly to the progressive and phased manner it has been implemented.

Throughout this article we will address some of the elements of this digitalisation strategy that has as its main goal the creation of a better experience for the taxpayer, mainly through the simplification of tasks and reduction in the administration's response times.

It all starts in our portal. The AT's homepage on the Internet features the most frequently used services, allowing faster access to key taxpayer options. However, from there it is also possible to access a wide range of services including, among others, the possibility of obtaining certificates (tax residence, non-debt, real estate, etc.), obtaining duplicates of settlement and collection notes, consulting notices on the tax situation, keeping up-to-date on deadlines for the reporting obligations, consulting tax and customs legislation, submitting tax returns, asking questions, etc... and all this without leaving the comfort of your sofa!

Automatic Personal Income Tax

Concerning the electronic submission of tax returns, AT chose a phased introduction.

Before 2018, PIT tax returns submitted electronically were, for most taxpayers, an alternative to paper submissions (for entrepreneurs and self-employed people, the Internet delivery obligation had already been in force for several years). In 2018, already with about two decades of experience and with a take up rate for the submission of tax returns by electronic means of more than 97%, this procedure became mandatory for all taxpayers.

Measures such as the pre-filing of electronically submitted declarations based on information provided by third parties and, more recently of the SAF-T (Standard Audit File for Tax purposes) were essential for the implementation of the automatic Personal Income Tax. AT was a pioneer in this option. We were the first country in the world to follow OECD's recommendations for its implementation. This was also an evolutionary process, widening its scope over time.

Based on the obligation that companies have to maintain a SAF-T invoicing file, we invested in other projects, such as software certification and e-fatura (e-invoice), which in its turn influenced new developments such as "fatura da sorte" - rewarding the consumers' fulfillment of obligations - and the development of projects for the voluntary fulfillment of obligations, with the creation of alerts triggered by the detection of discrepancies and, finally, with the automatic submission of tax returns. These projects have also proven to be a great influence in the digitalisation of the accounting procedures of the economic agents, allowing the automatic integration of invoicing in the accounting records, minimising errors and simplifying the process.

However, the main result of the implementation of SAF-T was an exponential increase in the amount of information available, opening up several usage opportunities.

In order to encourage final consumers to request the issuance of invoices for the purchase of goods or services, the deduction of expenses in the calculation of personal income tax now depends on the identification of the purchaser (through the tax identification number - TIN) at the time of acquisition. This indication allows that the deductible expenses have already been calculated upon the submission of the tax returns, making the whole process easier.

Obtaining the information by this means, together with the possibility of using all the other remaining information that is compulsorily reported by economic agents (such as the amount of the income paid and the withholding tax), made it possible that at the time we made the electronic submission of personal tax returns mandatory, the whole process had been automated.

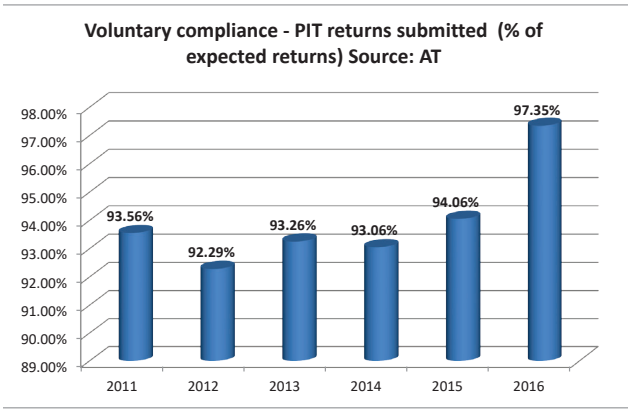
Although the pre-filing of tax returns was common practice more than ten years ago, the automation of the whole procedure is an important development. Currently, not only is a provisional return made available to the taxpayer, but also the respective settlement. The taxpayer then has the option of reviewing the information and confirming it. If the information is confirmed, the return becomes final and the settlement is immediately processed, allowing a faster reimbursement (when applicable).

In practice, a few minutes will be enough for the entire process, which can be performed either on the AT portal or through an application available for mobile devices. However, if a taxpayer does not agree with the return and with the settlement presented this way, the system allows the information to be filled in manually. The process will be more time consuming, since it implies verifying the amounts submitted, but the reporting obligation is fulfilled.

On the other hand, if a taxpayer does not take any action within the established deadlines, the provisional return will be automatically processed, thus becoming final.

All this process, besides including obvious advantages in simplifying taxpayers' obligations fulfillment, significantly reduces cases of discrepancies and the need for subsequent verification and consequently reduces the tax administration's costs.

Currently, the automatic tax return is available to all taxpayers who are beneficiaries of dependent income or pensions paid by resident entities and whose deductions are known to the tax authorities (as a result of compliance with reporting obligations of economic agents). This represents three million households (or returns), and about 60% of all taxpayers.



E-counter (E-balcão)

Nonetheless, taxpayer assistance is not limited to simplifying reporting obligations. Outside this context, taxpayers often need to address tax authorities to clarify doubts or obtain information.

In order to respond to this need without the taxpayer having to contact the services in person or by telephone, AT developed a 24/7 electronic helpdesk, the e-balcão.

Taxpayers submit their requests or questions at the e-balcão and a CRM system - Customer Relationship Management - manages the entire structureprocess to ensure the monitoring, coordination and control the adequate level of response in terms of time and quality. Even when the response to the problem depends, for its solution, on the involvement of several services, the system ensures coordination between the different areas. On the other handIn addition, this service also presents the advantage of keeping a record of contacts, which allows a quick and simple access to the already raised questions already asked and resolved.

By interacting through the AT Portal, e-balcão ensures the security and privacy of the taxpayers' data, since the access to this service is done through authentication in the Portal.

With the launching of this service, AT is confident that the use of the electronic platforms to simplify and bring the taxpayer closer to our customer service, with the final purpose of making this service the most important channel of communication between the administration and the taxpayer, is achieved. Thus, it is possible to significantly reduce the physical presence of taxpayers at the local tax services, with obvious increases in productivity and cost savings.

In short, *e-balcão* significantly reduces financial, administrative and time-based costs in the taxpayers' relationship with the tax administration.

Other Services – Notifications

One of the main reasons that gave rise to litigation with taxpayers, were the notifications made by postal service. This was due to formal errors in the notification procedure and to situations where taxpayers simply did not have knowledge of the content of their notification in a timely manner. This situation, in addition to generating many conflicts with the tax authority, also entailed significant costs.

In this regard, AT has progressively introduced an electronic notification system, based on the creation of an electronic mailbox, which became part of the taxpayers' tax domicile, constituting a single digital contact address.

Currently, taxable persons subject to corporate income tax with headquarters or effective management within the Portuguese territory and the permanent establishments of companies and other non-resident entities, as well as resident taxable persons framed within the normal value added tax scheme, are required to have an electronic mailbox. For all other taxpayers, the electronic mailbox is optional.

The system receives information from AT's several internal applications, sending them to the taxpayers, obtaining the indication of the date and time in which the communications were consulted, updating this information in the applications.

Through this system, AT informs the taxpayers of their tax situation, including notifications for payment of taxes, debts or infractions, as well as issuing warnings and alerts. Furthermore, all the documentation sent is available for consultation, either by the taxpayers or by AT.

Communication becomes faster and more efficient, reducing administration costs and inconveniences to the taxpayer.

Conclusion

AT has been developing its digitalisation strategy in a phased manner, which has allowed a progressive adaptation of the taxpayers, but also of the services, to the new processes and forms of communication.

The constant effort to innovate and develop automatic solutions leads to efficiency gains essential to maintaining a high standard of service to the public, especially in view of the increasing difficulties experienced by all tax administrations in the training and maintenance of human resources with a high degree of specialisation.

Looking ahead, AT's focus will be on increasing investment in ICT, not forgetting the qualification of the resources, especially in the development of new skills among human resources.

This is because the ultimate goal is always to provide the best service by supporting voluntary compliance, through the cooperation with citizens.

User driven design of the ATO App

Fiona Dillon

Assistant Commissioner of the Australian Taxation Office (ATO) – Australian OECD Delegate (Tax)

Our digital vision

The ATO is striving to enable a digital economy which encourages taxpayers to willingly participate in the tax and superannuation system. Technologies will be available and mature enough for an entirely different tax and super experience for Australians and those conducting business in or with Australian businesses.

We envisage a future where digital services will be integrated into the systems and practices used by the community in their everyday lives and businesses, giving them a real time, contextual and complete view of their interactions within the economy in a transparent and secure way. Essentially, tax and super just happens.

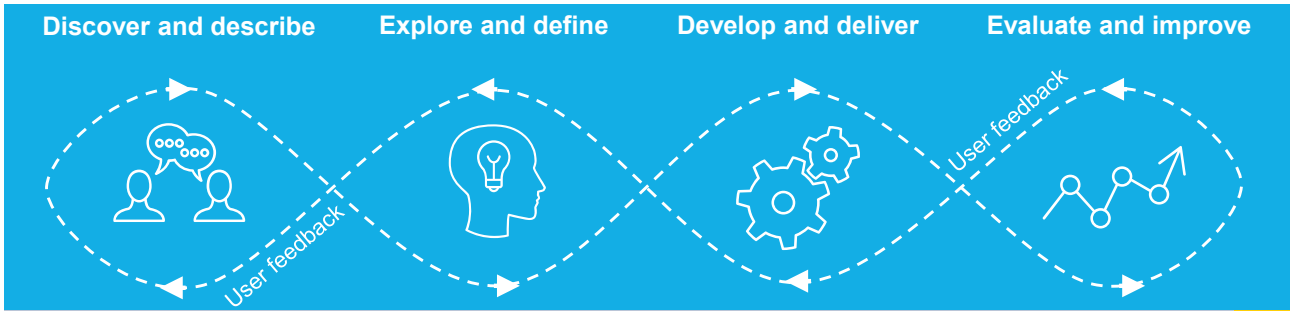
Digital Aspirations

1. Our digital services will be able to be embedded in the day-today natural systems of our clients or their representative
2. Client information will be exchanged automatically and in real-time
3. Our staff will be supported to broaden their digital and business capabilities to optimise their performance
4. A client's overall taxation and superannuation position will be known and visible on an ongoing basis
5. We will be able to identify early when a client needs help with their taxation and superannuation obligations
6. There will be minimal need to report or transact with us directly

Design centres

The ATO has designed and built centres that are used to support our design philosophy. The Centres have been designed to facilitate a collaborative approach to designing and shaping optimal outcomes for the community.

"The app was designed, built and delivered in just 8 weeks"



Initial analysis of taxpayer behaviour showed that many people were already interacting with us via their mobile devices. At this stage, web content was not mobile optimised. This was creating a poor customer experience and had us lagging behind the flexibility that many other organisations were providing. As a result, the ATO made the decision to enhance it's digital service offering by developing a mobile app.

We determined that an app was the most effective way to meet our users needs in providing channel-choice.

Design approach

The ATO recognises that change rarely follows a linear progression. As a result we have adopted a design method that is human centred, consisting of four distinctive stages. As we move through each of them we can continue to work through previous stages, allowing us to make informed, evidence based decisions on what is desirable for our users and the ATO.

The design of app focused on including those interactions that were high volume, with low complexity. We worked with low fidelity prototypes that helps users to be more engaged in the design and help us to design and iterate more rapidly, incorporating user feedback and testing into subsequent iterations. Using this method allowed us to design, build and deliver a minimum viable product within just 8 weeks.

What we delivered

Since inception we have had over 1.3 million people download the app. Of particular interest to us was that the number of users over the years has steadily increased, meaning that the retention rate is strong.

We are also seeing a strong correlation to usage of the app to access the ATO's online services and we typically see a huge spike in numbers around tax time.

Since the app release, updates have been released approximately every quarter delivering functionality for individual, small business or self managed super fund users.

In all, there have been 13 major releases as well as numerous other small releases to address technical issues, content updates and other minor improvements.

Jul 2013

Link to web content, tax rates, calculators

Dec 2013

Payment plan estimator, Employee v contractor tool

Jun 2014

Expand to superannuation segment

Jan 2015

Business lookup tool, personlised planner & calendar

July 2015

Deductions tool, voice biometric technology to authenticate clients

Next steps

Touch ID authentication, increase shift from web to the app

Improving the user experience

As we continued to listen to user feedback and observe their interactions, we improved functionality of the tool to meet user needs and expectations.

Over the life of the app, there have been over 15 user feedback sessions held aimed at understanding their needs and preferences. These sessions consisted of useability evaluation, testing and research.

Feedback has been largely positive since inception, although recent trends show that expectations are rapidly increasing and more is being demanded of the app.

All feedback is used to identify key issues we may have missed, contact users directly via the app stores and ultimately drive the future direction of the app.

Our learnings

The development of the ATO app has taught us some valuable lessons. With the benefit of hindsight, adjustments have been made in our approach since the deployment of the app.

The first key learning was the need to dedicate more time in the discovery phase of the design process. This allows us to fully understand the user's needs, their problems and the best way to resolve these. The focus can then be shifted on identifying technology opportunities to help deliver the required solution.

Care should be taken to ensure the design is the best fit for purpose. Is the app the best fit for the proposed product? It can often be perceived that it's the quickest way to deliver a viable solution to the market. However, catering for the majority and accepting the product may not suit every single user.

Finally, we learned that it is crucial to continue to invest in growth and development. As user expectations change so quickly in the digital space, we need to ensure there is continued investment in the overall product.

"A prototype doesn't have to be complex to be effective"

The future of the ATO App

Support clients to shift from our online (web platform) to the app

Use native authentication such as touch ID as an alternative to voice biometric technology

Make the app the default notification and interaction channel of choice for all ATO clients

TRANSFORMING TAX COMPLIANCE MANAGEMENT

IOTA
Intra-European Organisation
of Tax Administrations

WWW.IOTA-TAX.ORG

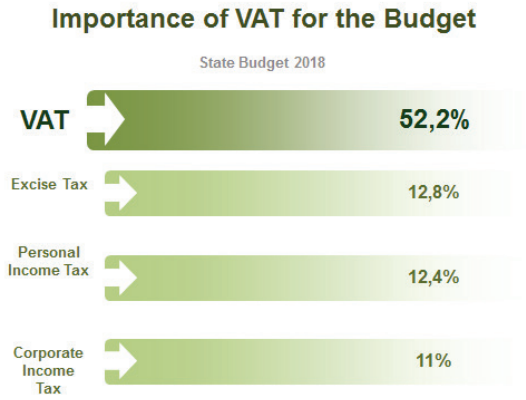
Combating VAT fraud in Ukraine: risk management system and e-refund

Anatoliy Aleksandrov

Acting Director of the Department of Strategic Development and International Cooperation, State Fiscal Service of Ukraine

Introduction

VAT plays an important role in contributing to the budget of Ukraine. Revenues of this tax make up more than half (52.2%) of the state budget revenues. Therefore, the control over the accuracy of VAT declaration has always been given special attention.



Over the past few years, Ukraine has implemented a number of important reforms to control the administration of the tax. Reporting and control have moved to electronic format.

VAT administration in Ukraine: challenges and solutions

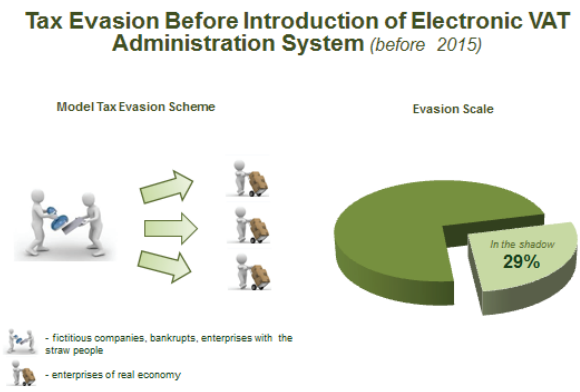
The main problem was the minimising of VAT obligations through the creation of fictitious enterprises, the so-called "one-day" companies.

In order to solve this problem in Ukraine, at the first stage, the requirement for disclosure of the counterparts of the taxpayers was introduced. This made it possible to detect evasion schemes, but there was no effective tool for counteracting these schemes.

For the evasion purposes, "one-day" companies were often used, and their audits, or audits of the companies that used their services, did not show positive results, because:

- Most of the decisions of the tax authorities were appealed in the courts; it was difficult to prove additional tax assessment in the court, several years could have passed from the time of additional assessment to the date of its payment, if indeed anyone was actually left there to pay the assessment;
- Due to the long audit process, there were significant delays in VAT refund;
- At the same time, there were significant budget expenditures on audit and legal costs.

The estimated scale of evasion was 29% of the declared tax amount.



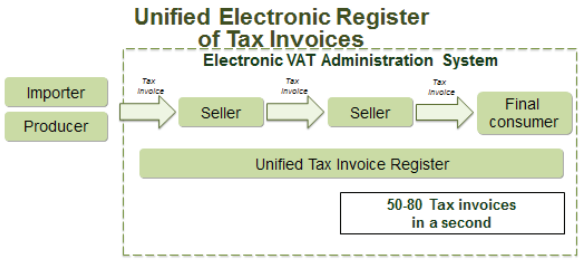
One of the solutions for this problem could be full automation of VAT movement along the chain of "production-sales-consumption" and with it the appropriate automated control.

For this purpose, an **Electronic Unified Register of Tax Invoices** was introduced. This register allowed us to:

- form extracts and register tax invoices for all transactions that are subject to registration in the Unified Register of Tax Invoices;
- exclude possibility to include values of a tax invoice in a tax declaration (report) if the tax invoice was not registered;
- exclude the possibility to issue and include a tax credit if the tax invoice to which it related was not registered.

Today SFS servers process around 20 million tax invoices per month and 3 thousand invoices per minute.

The Unified Register of Tax Invoices was used to establish our **E-VAT Administration System in July 2015.**



- ***Tax invoices are issued for all business transactions*** *and to be registered in the Unified Tax Invoices Register (hereinafter - UTIR)*
- ***Without a registered tax invoice, you can not generate tax reports***
- ***Without a tax invoice*** *registered in the UTIR,* ***it is impossible to form a tax credit (deduction, credit)***
- ***In a month*** *SFS server processes* ***20 million*** *tax invoices,* ***every single minute - 3 thousand***

The main purpose of this system is to provide fully automated processes of VAT administration and control over the occurrence of tax liabilities and VAT payment. The system allows for the depositing of the amount of VAT that shall be paid or refunded.

Thus, some of the key elements of the system are the Unified Register of Tax Invoices and an Electronic Account for depositing the amount of VAT that shall be paid (such an e-account is automatically opened in the Treasury Authorities based on information from SFS).

The system also prevents registration of tax invoices without paying VAT.

Introduction of the system has led us to a reduction of VAT debt to 16,9%.

Unresolved issues remained in the area of selling goods for "cash" and further sale of tax credit (credit, deduction).

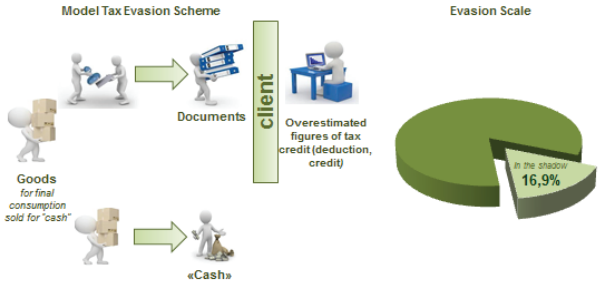
The typical scheme of tax evasion aimed to minimize tax liabilities due to the substitution of goods at the time of sale (the sale of documents on the product which was preliminary sold for cash).

The next stage in the fight against VAT evasion was the implementation of an automated Control System of Economic Transactions which made it impossible to form VAT on risk operations.

Automated analysis of economic transactions where the analytical system of risk determination is applied, became the main component of this system.

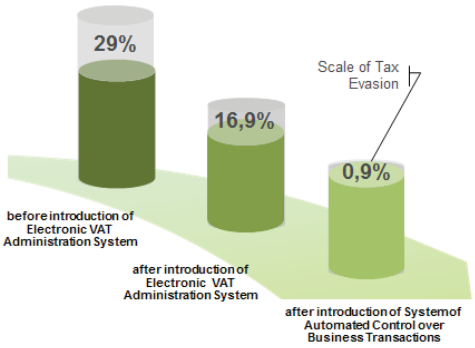
As a result, the opportunity of gaining double profit by taxpayers while selling goods to final consumer for cash and selling tax liabilities on already sold goods is limited.

Tax Evasion After Introduction of Electronic VAT Administration System (before 2018)



As a result of improving our VAT administration processes, the level of tax evasion decreased from 29% (before the Electronic VAT Administration System was implemented) to 16.9% (after the Electronic VAT Administration System was implemented), and ultimately to 0,9% (after the Electronic Control System of Economic Transactions was introduced).

Effectiveness of VAT Administration



Due to the reduction in the level of tax evasion, the implementation of **electronic VAT refund** became possible.

- cancellation of the manual VAT refund;
- full automation of the VAT refund process;
- free access to the VAT refund register (through the web-page of the Ministry of Finance of Ukraine);
- taxpayer's control of the whole process from application to getting money;

- chronological order of VAT refund;
- audit of public system with justification and timeframes;
- excluded possibility to postpone payment without clarifications/ cancellation/ expulsion from the list of taxpayers.

Conclusion

VAT fraud and incorrect reduction of VAT liabilities is still a complicated problem for many tax administrations, leading to significant budget losses. It requires global, systematic and comprehensive solutions, starting with designing an appropriate legislative framework and ending with sufficient human and technical resources. In order to overcome the challenges caused by VAT fraud, tax administrations should focus on the development of IT infrastructure and automated systems to support their performance and risk management processes. The Electronic VAT Administration System in Ukraine has proved its efficiency and can serve as a good basis for further developments in this area, aimed at more transparency, reducing compliance costs and assisting taxpayers to perform and meet their tax liabilities.

Big Data Analysis as an effective tool for tax administration

Mikayel Pashayan

Deputy Chairman, State Revenue Committee of Armenia

A. Introduction

Since 2008, the Armenian tax administration, which is part of the State Revenue Committee of the Republic of Armenia (SRC), has carried out over 30 projects aiming to automate data collection and to implement analytical systems to raise the effectiveness of the revenue collection process. As a result, as of 2018, the tax administration possesses huge amount of data, an operating monitoring centre and effective tools to identify risky taxpayers and to take a target-oriented approach in working with them.

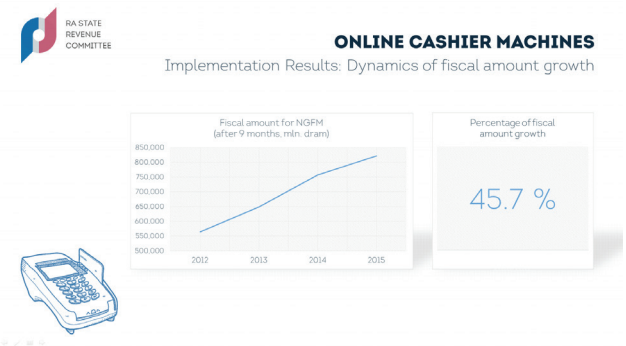
In this article we present the most interesting and effective tools and some major outcomes of our work.

B. Data Collection Methods (Usual direct and B2B)

First of all, it is important to pay attention to the methods of data collection by SRC. Besides the traditional method of data collection from taxpayers via tax returns, declarations, payment documents, SRC has implemented two so-called "indirect" methods to obtain the required information both of which are, as a matter of fact, B2B services, but at the same time provide the tax administration with very important data.

B.1 METHOD 1. NEW GENERATION FISCAL MACHINES (NGFM).

In 2008, online cash registers were implemented as a requirement at points of sale in Armenia. The Armenian government is carrying out the implementation of such registers gradually, step by step. It started with points of sale having higher risk, like big markets with many traders, and cash registers were connected to SRC's server using GPRS network. Later, large taxpayers with annual sales above the established threshold carrying out retail trade were required to use these cash registers. Gradually, on the one hand, more taxpayers started using cash registers, and on the other hand, cash registers provided more and more services, both to sellers and buyers. Besides printing fiscal receipts, which is the main function of new generation fiscal machines, they can operate as POS terminals, issue electronic invoices, and save and print information about goods and prices. Today, they are connected though 3G and 4G, WiFi, Ethernet networks, and send information to SRC's data centre online, without increasing the taxpayers' burden. Taxpayers no longer need to file returns on the sales fiscal amount. This is an advantage for the tax administration since it can access all the information about retail transactions online. As a result, SRC's Monitoring Centre can effectively identify risky taxpayers, as it will be shown further on in this article. Implementation of NGFM immediately raises the effectiveness of audit cases and reduces the number of such audits. It is also noteworthy that after implementation of NGFM, fiscal amount have drastically increased (see picture 1).



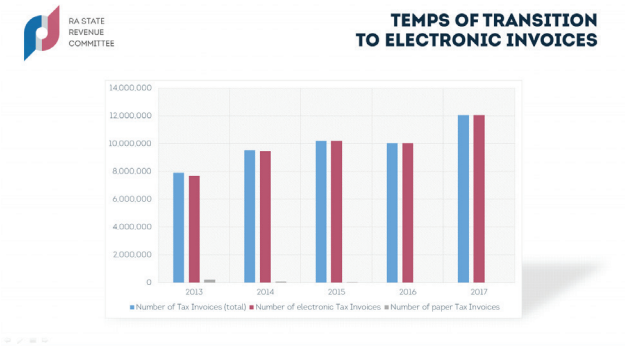
Picture 1. Implementation of NGFM

B.2 METHOD 2. E-INVOICES

Another B2B service that enables the tax administration to collect and analyse data is filing of electronic "buy-sell" invoices. Since 2013, Armenian taxpayers have gradually been enabled to file invoices electronically online. The "paper -> e-document" transfer process was implemented in four years, concluding in 2018 with fully electronic filing of invoices (see picture 2).

In this case again, lots of routine paperwork was eliminated for taxpayers, some types of reports were

cancelled altogether. For all kinds of documents (invoices, account documents etc.), issued by taxpayer to taxpayer, according to the law, electronic format is mandatory. The e-invoicing system provides all of the functionality associated with filing of invoices including filing, confirmation, correcting and deleting. For the tax administration a powerful tool to identify risky taxpayers is cross-checking of information received online from buyers and sellers. Another possibility is comparing sales turnover with the figures in invoices and declarations, which is done monthly or quarterly.



Picture 2 Implementation of e-invoices

C. Big Data suggests new possibilities

As a result of our activity, SRC possesses a huge volume of data about Armenian taxpayers. As of the beginning of 2018, it composed terabytes of information. The next questions, of course, must be how we are using this information and whether we are using it effectively.

Big data processing systems and approaches enable statisticians and other analytics professionals to analyse growing volumes of structured transaction data, plus other forms of data that are often left untapped by conventional business intelligence (BI) and analytics programmes. Our Analytical System is based on modern analytics technologies and techniques and provides a means of analysing data sets and drawing conclusions.

One of the problems for the Armenian tax authority (and perhaps the authorities of some other countries as well) is the problem of the co-called "interconnected" taxpayers.

One of the ways to avoid paying taxes is to permanently remain a small taxpayer. In this case a firm operates up to a point when it reaches a threshold in amount of sales, then it closes and later reopens with a new name as a totally new "small" firm.

This means they are using disaggregation, which is dividing a large business into a number of small businesses for the purpose of having a low level of sales and number of employees in each separate business. The aim is to remain a small or medium taxpayer and to pay less taxes. In fact, instead of being a payer of VAT, the owner divides their business among a number of relatives and friends, each of them paying turnover tax, which has a smaller rate compared to VAT. Therefore, the tax administration's task is to identify interconnected enterprises and to collect the correct amount of tax.

C.1 How to identify interconnected taxpayers

METHOD 1

The first method is based on the information from the Single Administrative Document (SAD) about importers of goods. Analytics can be done if different taxpayers, but the same group of them, are always importing from the same country, purchasing and importing the same goods from the same seller enterprises each time. Also, from electronic invoices it can be established that a certain group of taxpayers uses the same storage for imported goods. In any case the situation is suspicious and subject to be checked by the tax administration.

METHOD 2

The second method is based on information about sellers. In this case we use data collected in the registration database, NGFM and invoice databases. From the invoice database one can see that a number of different taxpayers are selling goods from the same storage. From NGFM data we check and find out that the group of taxpayers have and use their fiscal machines at the same address. From the registration data we find out that different enterprises have the same founders. Again, maybe there is no tax fraud, but such a case would be suspicious and should be audited.

METHOD 3

The third method concerns taxpayers' employees. In this method we consider suspicious cases in which different employers report about the same group of employees in income tax declarations. In other case one can see that a closed and reopened enterprise has the same group of employees. In such cases we use database with information about SSN (social security number).

C.2 Unrealistic sales

This part of Monitoring Centre's analytical work is based on information received from NGFM. Online information about printed receipts and fiscal amounts of transactions gives totally new opportunity to identify risky taxpayers. For example, if a fiscal machine does not work throughout the day, and 100 or 200 receipts have been printed within one or two hours, this means that for some reason the taxpayer does not print real receipts in real time but just fills a fiscal amount with false receipts without actually selling goods. The other possibility to file a fiscal report is to print a single receipt with an unrealistic amount at the end of the day.

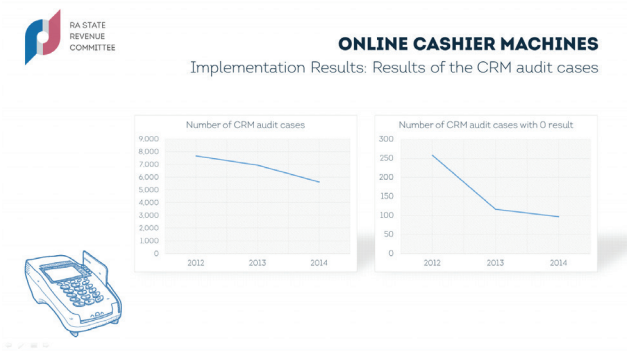
All such cases are under control since the Monitoring Centre automatically sends notifications and requires explanations. If no reasonable explanation is given, the case goes to audit.

Comparison of data from utility providers (water, electricity, gas, etc.), i.e. expenses of an enterprise with the total amount of reported sales could also help reveal an unrealistic report. Sales would be low, expenses would be high, and again notification would be sent. SCR's further actions depend on the explanation given by the breaching firm. Often taxpayers just present corrected declaration with the actual amount of tax to be paid.

D. Outcomes

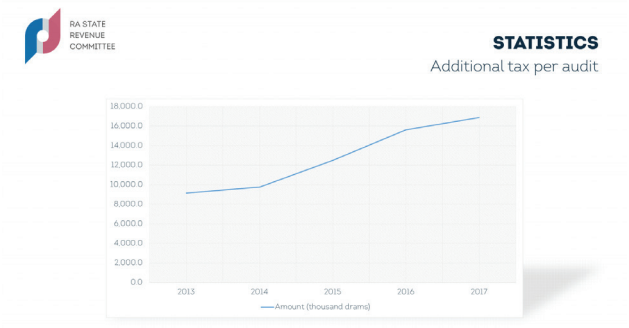
The main outcomes of Big Data Analysis can be easily seen in the pictures below.

In Picture 3, we present the results of the audits with regards to use of cash registers. Because of targeted audits conducted during the first years of implementation of NGFM, the tax administration has reduced the number of audit cases. More interestingly, the number of audits with no registered fraud has decreased by about 2.5 times in the past 2 years.



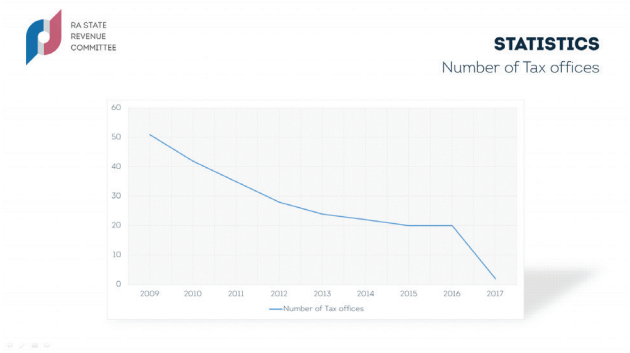
Picture 3 Audit cases for NGFM

Besides the cash register cases, as a result of Big Data analysis the effectiveness of conducted audits has also risen, which can be seen in Picture 4. AS a result of our targeted audits of risky taxpayers, the average amount of additional tax per audit has been constantly growing over the past years.



Picture 4 Tax per audit

A more important outcome of automation and wider use of collected data is the rapid reduction of the number of local offices of tax administration. (See Picture 5). From a huge number for Armenia (52 offices in 2009) we now effectively work from only at two offices which are the departments for Large Taxpayers, and Small and Medium Taxpayers from 2017.



Picture 5 Tax offices

Real-time VAT reporting techniques: the Spanish Immediate Supply of Information System (SII)

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Mercedes Jordán

Deputy Director for Tax Technique, Spanish Tax Agency

Introduction

The Spanish Immediate Supply of Information System (SII) for VAT management is a very good example of the transformation of Tax Compliance Management through digitalisation. After 30 years of traditional management of VAT, now, thanks to this innovative project which has been in force since July 2017, the digitalisation has been accelerated and the interconnection between companies and the Tax Agency has been improved. Around this system, new assistance tools have also been developed based on the use of the electronic channel and new technologies.

MAIN FEATURES OF THE SII

The SII changes the way in which VAT taxpayers must supply information about their transactions and keep their VAT-related books and records. The new system implies the electronic transmission of the billing records to the Tax Agency in a short period of time (4 days), bringing the moment for registration of invoices closer to the date of the underlying economic transaction. This means that the books will be kept directly in the electronic office of the Spanish Tax Agency, but the taxpayer doesn't need to forward the invoice itself.

The objectives of the project are two-fold: *assistance and control*. Regarding assistance, in a first step we offer taxpayers tax information to allow cross-checking, but we aim to offer a pre-populated VAT return in the future. In terms of control, the immediacy of the information is a crucial factor and will allow faster and better targeted control actions.

The SII is mandatory for business registered in Spain with a turnover higher than €6,000,000, businesses that are registered in the monthly refund scheme (REDEME), and those registered as a VAT group in Spain. All of them must submit monthly VAT returns. The rest of our VAT taxpayers can also enrol on a voluntary basis.

The books that must be kept online in the Electronic Office are the following four:

- Register Book of issued invoices.
- Register Book of received invoices.
- Register Book of investment goods.
- Register Book of specific Intra-Community operations.

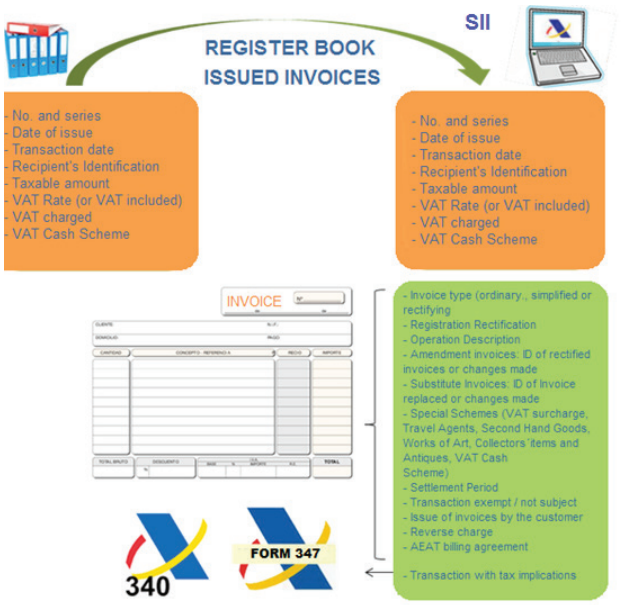
In order to register the invoices, taxpayers must send the invoicing details to the Tax Agency through web services based on XML. Those details are incorporated into the online Register Books.

The following picture shows the transmission schema:

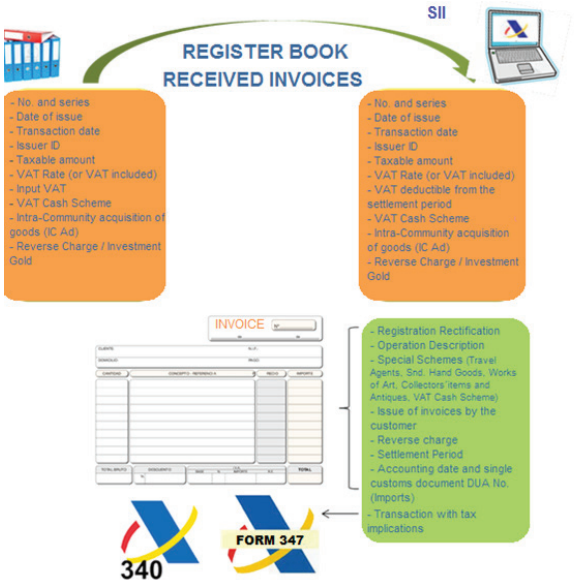
One of the Key features of the Project is the immediacy of the data reporting: 8 days in 2017 (adaptation period), 4 days in 2018 and onwards, with some particularities.

Regarding the information on invoices to be submitted, the main data is the invoice number (and serial number if applicable). The number is essential to identify the invoice and be able to compare the information. Other fields requested are, as an example: issuance date, transaction date, taxable amount, tax rate, type

of invoice (complete, simplified, amending), description of the transaction, settlement period or special regimes. For issued invoices, it must also state whether the transaction is not subject to VAT or is exempt from VAT.



For received invoices, the deductible amount must be reported.



RESULTS OF SII

Entry into force: 1 July 2017
Since then....what has happened?

After having run for one year, the main figures are the following:

Number of taxpayers enrolled: 54,000 taxpayers in 2017, 57,000 in 2018, most of them mandatorily.

Uptake: in terms of number of taxpayers they represent a 1.5% of VAT taxpayers, but in terms of turnover they represent 80%.

NUMBER OF INVOICES AND AMOUNT:

2017 (*)

Number of issued invoices registered	Total amount on Issued invoices	Number of received invoices registered	Total amount on Received invoices
1,801,316,373	1,492,570,104,132 €	610,511,628	1,342,179,212,574 €

(*) though the system entered into force in July 2017, the information on the invoices of the first semester had to be submitted retroactively until December 2017, with the exception of REDEME taxpayers.

2018 (January-June)

Number of issued invoices registered	Total amount on Issued invoices	Number of received invoices registered	Total amount on Received invoices
835,596,321	795,911,597,730 €	287,989,788	718,767,586,399 €

ADVANTAGES, PROBLEMS AND OPPORTUNITIES RESULTING FROM THE SII IMPLEMENTATION

ADVANTAGES

Enrolment in the SII system has a number of advantages both for taxpayers and for the Tax Administration:

Advantages for taxpayers:

- Simplification of formal obligations: at the time of implementation of SII, some informative obligations were considered redundant and, thus, have been removed, namely, the recapitulative statement and statement of operations with third parties.
- Availability of tax information contrast: the VAT Register Books contain the self-declared information and the information declared by third parties. Thanks to this information, the error in compliance with formal obligations and in the tax returns can be reduced.
- Extension of the deadline to submit self-assessments by ten days.

Advantages for the Tax Administration:

- Improvement in taxpayer control: immediacy of information and availability of cross-checks enable better control actions.

PROBLEMS DETECTED

One year on from its implementation, the main problems detected are:

- Difficulties in the identification of clients and providers

- Commercial practice not in accordance with regulations. In some cases because the legislation had become obsolete.
- Poor knowledge of SII, invoicing and VAT rules by taxpayers.

IMPROVEMENT OPPORTUNITIES

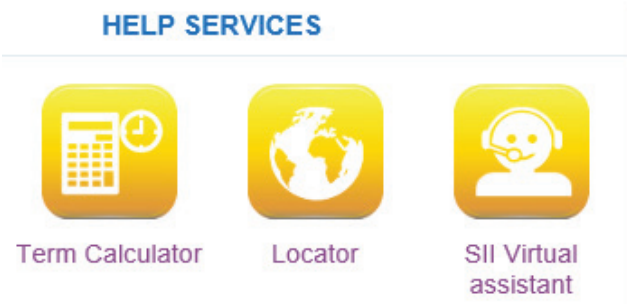
The above-mentioned problems have helped AEAT identify important improvement opportunities. The following opportunities can be mentioned:

- Census update, in order to solve identification problems.
- Regulations update in order to adjust the rules to the real economy.
- Improving and increasing assistance services and communications channels: conferences, FAQs, mailbox, forums, online assistance tools.

ASSISTANCE TOOLS DEVELOPED FOR SII

The SII is a very innovative system; consequently, there was a great demand for information. There were over nine hundred weekly consultations. The Tax Agency´s assistance services were overwhelmed and not able to provide all the information required just by themselves.

Therefore, the Spanish Tax Administration decided to create three tools to meet this information demand (term calculator, locator of the place of supply and virtual assistant; the latter introducing artificial intelligence technology to our assistance services for the first time). These tools are available on the Tax Agency´s website.



TERM CALCULATOR

It was the first tool developed for the SII system specifically. It is an in-house solution.

The term calculator tells you:

- The deadline for submitting information on an invoice
- The period in which the invoice must be registered and declared.

The calculator was launched on 26 June 2017; 356,097 consultations have been made up to 22 June 2018.

LOCATOR

It is a very useful tool, developed jointly by the IT Specialists of the Tax Agency IT Directorate, and tax experts of the Tax Management Department, which answers three specific questions in relation to international operations:

- Where is the place of supply of the supplies of goods or services?
- Who is the taxable person?
- Is VAT charged (or not) in the invoice?

The locator is very helpful not only for taxpayers enrolled in the SII system, but also for any taxpayer involved in international operations.

The locator´s main objectives are as follows:

- Assisting businesses to declare and pay VAT properly in their foreign trade operations.
- Helping taxpayers to avoid double taxation.
- It will also be especially useful to support a better understanding of changes introduced in VAT at EU level from 1st January 2021.

The locator has been developed in two phases: on 15 February 2018 the services locator was launched and on 14 June 2018 the supplies of goods locator was launched. Up to 22 June 2018, 73,564 queries on services and 1,684 on goods have been made.

THE VIRTUAL ASSISTANT

This tool has been developed jointly by the IT Specialists and tax experts of the Tax Agency and an external IT services provider.

The virtual assistant answers questions from all kinds of users; either taxpayers, tax advisers or civil servants. It has been developed in three steps:

- Analysis of the questions from users and design of dialogues.
- Training of the assistant.
- After the launching, the assistant continues to be trained and improved with conversational auditing.

The virtual assistant for SII was launched on 20 October 2017. Up to 22 June 2018, 47,698 consultations have been made.

On 14 June 2018 the virtual assistant for foreign trade was opened and we expect to have it fully implemented for the full coverage of VAT by 2019.

Conclusions

The SII marks a *before* and an *after* for the Spanish Tax Administration.

- We have started a new model of communication with taxpayers.
- Based on the SII system, we have changed our control and risk analysis model.
  - We are currently moving towards a new on-line information model characterised by:
  - More legal certainty.
  - Comprehensive, immediate and interactive information.
  - Information quality monitoring.
- We have developed sophisticated online assistance tools firstly aimed at SII assistance but later expanded to the whole of VAT.

Reference links

SII AND ITS ASSISTANCE TOOLS:

https://www.agenciatributaria.es/AEAT.internet/en_gb/Inicio/La_Agencia_Tributaria/Campanas/Suministro_Inmediato_de_Informacion_en_el_IVA__SII_/Suministro_Inmediato_de_Informacion_en_el_IVA__SII_.shtml

VAT ASSISTANCE TOOLS:

https://www.agenciatributaria.es/AEAT.internet/en_gb/Inicio/La_Agencia_Tributaria/Campanas/IVA/IVA.shtml

TRANSFORMING OPERATIONS AND PROCESSES

IOTA
Intra-European Organisation of Tax Administrations

WWW.IOTA-TAX.ORG

Increased compliance and efficiency with Machine Learning

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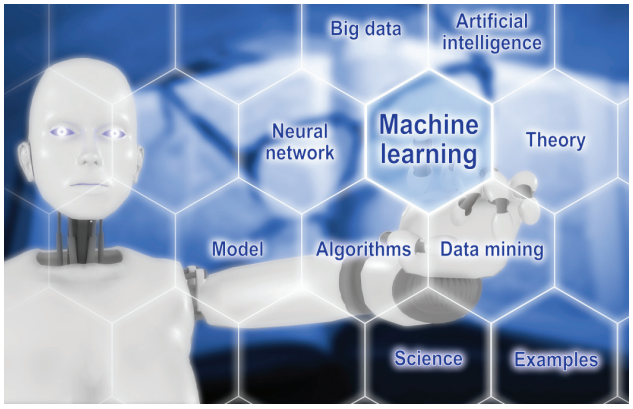
Introduction

The past few years, machine learning has moved from science literature to the business press, and companies are now integrating machine learning in their business models. Regular citizens encounter machine learning almost daily, although they are not always aware of it, and tax administrations all over the world are looking into how machine learning can be used. This article gives a short overview of what machine learning is and what it can be used for, and in the end describe some of the experiences with machine learning in Norway.

1. What is machine learning?

Machine learning is when computers through statistical techniques are able to "learn" from data, without being specifically programmed to do so. Learning in this sense means progressively improving performance on a specific task. What machine learning does is to find patterns and regularities in data that can be applied to new data to predict potential risks and opportunities. Machine learning is not the only important area in this field. Others include Deep learning, Advanced analytics and Robotics – not the same thing, but overlapping areas referring to the same basic analytical techniques as machine learning. Often, machine learning is referred to as a subset of artificial intelligence.



2. When to use machine learning?

Machine learning techniques can be and are used for a range of tasks. For tax administrations, the three most relevant areas are:

- analysing patterns in historical data to identify risks and opportunities (predictive analytics)
- analysing text to categorise and find patterns and trends (text analytics)
- analysing data to find networks in data and how networks are related to each other (network analysis)

Of these three applications for machine learning, the most commonly used is probably predictive analytics; a simple predictive model can have a big impact, and it can be cost efficient.

3. Why should tax administrations use machine learning?

Tax administrations have access to an increasing amount of data about taxpayers, and at the same time, the power of analytical software has increased greatly. To make use of all this data, new methods and techniques are required. Machine learning techniques provide opportunities to analyse the data to a degree that other traditional methods cannot. By applying machine learning methods, tax administrations can:

- **Increase efficiency**

By letting the computer analyse the data, we let the algorithms do part of the work – the algorithm can for instance do audit selections, determine information needs, or determine risks. Thereby, tax administrations can use their human resources on other tasks.

- **Increase compliance**

By letting the computer analyse the data, we get more insights into risks and taxpayers' behaviour and can design appropriate measures and actions that will have an impact on compliance.

- **Provide better service**

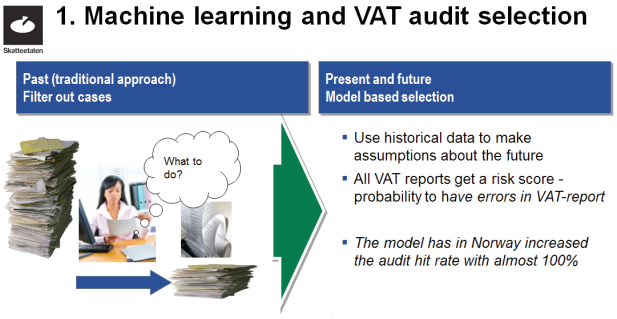
By letting the computer analyse the data, we can better understand taxpayer's needs and issues, which means we can adapt information and other activities to these needs and respond quicker.

- **Equal treatment**

The algorithms have less bias than humans do. Humans may treat taxpayers differently. A machine treat everyone the same way - removing human error and bias completely. However, if the machine learning algorithm are fed with data containing errors and biases, the algorithms replicate it.

4. Examples of application of machine learning

The Norwegian Tax Administration has implemented machine learning algorithms for VAT audit selection. The algorithm is trained on historical data and predict the probability of error in each VAT return. The caseworkers are presented with the score and could start auditing the cases with the highest probability of errors. As more VATreturns are audited, the algorithm gets more data to use in the model and the model improves, hence machine learning. The audit hit rate has almost doubled in comparison with the manual process, and in addition, the differences in hit rate between caseworkers have been reduced.



VAT registrations

The Norwegian Tax Administration is currently developing machine learning in a new field – to handle registration in the national VAT register. In Norway, all companies liable for VAT must register in the national VAT register. A scoring model categorises all registering companies into one of four categories. Since there is no historical data on the particular company, the categorisation is based on the owner's past behaviour and the behaviour of similar companies in the register. The risk score could divide all registered into one of four groups:

1. **Low risk group** - no need for extra follow-up (No problem group)
2. **Risk of errors** – this group will probably have problems paying correct VAT, but will probably do the right thing with guidance and information
3. **Risk of fraud** – it is highly probable that the company will try to avoid paying correct VAT, so it must be followed up with frequent audits
4. **Risk of crime** – the company has the characteristics of being part of a criminal network and should therefore have special follows-up.

5. What does it take to use machine learning in a tax administration?

As described above, machine learning can provide tax administrations with several benefits. However, in order to implement machine learning techniques in a tax administration several things must be in place.

- First and foremost, the tax administration needs to adapt its data for machine learning:
  - This requires data to be digitalised. Machine learning require huge amounts of data, and while more and more data is digitalised, tax administrations still have a great deal of data on paper.
  - Digitalisation of data is not enough; data must also be accessible for analytical purposes. That means it must be possible to import data into an analytical software.
  - The data has to be consistent, that is, to have the same definition across databases and not change data structure and definitions over time.
- The tax administration must have software for machine learning and for implementing the models in production. There is a range of software on the market, some even open source, but the more integrated the software is in the IT-infrastructure, the easier and faster it is to put the models into production.
- The tax administration needs to employ analysts that are able to develop and programme machine learning software. Analysts with an education in statistics, computer science, economics or mathematics usually have these skills.
- To benefit from machine learning the organisation must be willing to work in new ways. It is therefore important to involve those parts of the organisation that are going to use machine learning.

6. Pitfalls

If all of the above is in place, there is still a risk that your machine learning project will fail. Two important aspects must be considered:

LEGAL
There are strict regulations for how tax administrations use and combine data. Machine learning techniques tend to produce inexplicable decision-making trees that are essentially black boxes even to those who wrote the programmes. Machine learning techniques are challenging current laws and regulations, as they cannot keep up the pace with new technological possibilities. It is therefore essential to involve the legal department and carefully consider the legality in the machine learning project.

ETHICS
It may be legal, but it may not be ethical. Ethics is and always has been important for tax administrations, but by using machine learning new ethical dilemmas arise. The sheer amount of data that can be analysed in almost endless possible ways makes it possible to see patterns and predict outcomes with a high degree of probability. Using machine learning, we can for instance predict bankruptcies and salary development. Moreover, as the tax administration has access to the population register, in some cases we can predict life-changing events like divorces.

An issue with machine learning that has been raised many times is that the data used to train machine learning models is often biased. By underrepresenting or excluding certain groups or subgroups this kind of 'sampling error' leads to skewed outcomes. An example would be if your audits have detected tax evasion in a certain group (e.g. carpenters or an ethnic group) and you train the machine learning algorithms on this data, it would tell you that everyone that resemble this group is a potential tax evader. Machines learn from whatever we tell them to. If we feed the machine biased data, the machine will make biased predictions. To overcome this we need to control the input data and go to great lengths to ensure unbiased input data.

"Algorithms are not objective,
but they form an uncomfortably objective
indictment of our sins."

https://www.oreilly.com/ideas/if-prejudice-lurks-among-us-can-our-analytics-do-any-better

Conclusions

Machine learning can provide tax administrations with a powerful tool to increase efficiency, combat tax evasion and provide better customer service. Machine learning techniques are in their infancy, but their limited use has already shown potential. Many tax administrations have started to use machine learning techniques, and the position tax administrations have in society makes it important for us to share our experiences and success stories.

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Digitalisation of internal processes in the Italian Revenue Agency

Giuseppe Buono

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STATE OF THE ART AND KEY CHALLENGES

Introduction

Digital transformation of Public Administration represents a key enabler to improve the performance of government services, creating real benefits for their constituents. At the same time, citizens and enterprises ask for increasingly digital and efficient services, in line with their customer experience with digital services available on the market (e.g. e-commerce): this apparently implies a double-sided challenge, where the organisation seems to be involved in improving its digital services offering in the front-office, as well as in evolving information system supporting internal processes in the back-office. But in reality the challenge is one, corresponding to transform organisation and supporting ICT assets in order to digitally re-engineer processes with a common 'end-to-end' vision.

The Italian Revenue Agency started its ICT journey in 1976, having a strong boost in the middle of '90s where ICT became a relevant production factor. Several years ago, the Agency started a renewed digital transformation journey, being committed to provide increasingly digitalised services, accessible through several channels, as well as continuous is the effort spent to leverage on innovation to evolve the Information System. Moreover, the Italian law regulating ICT in the public administration first issued in 2005 the Codice dell'Amministrazione Digitale (Digital Administration Code), creating and periodically updating law and related technical rules according to the technology and society evolution; this helped the Agency – as well as other PAs - to leverage on common rules and manage the ICT services evolution with a specific focus on regulatory compliance.

The Agency has a diverse and large application landscape, automating all administrative procedures: in this context the key challenge is to change the perspective, moving gradually from a 'siloed' and fulfillment-centric view towards a citizen-centric view, at the same time considering also the "employee-centric" view in order to maximise productivity with a particular attention to employees' culture and change management. This requires a complex revision of all applications services and data management, implying "disruption" of application silos in favour of a strongly integrated and well-orchestrated services set, supporting the end-to-end administrative processes.

In 2016 and 2017, the Agency prepared all needed services and assets to manage all administrative documents as digital documents, to be digitally signed by executives and delegated employee, enabling the option to adopt digital communications to taxpayers as preferred channels, for both formal communications and informal event notifications, enabling core business units to leverage on digital to better realise their mission, improving processes effectiveness, productivity, relationship with users. At the same time, the Agency is at work to standardise base services as enterprise content and document management, standard framework for business processes for workflows, automation of cross-functional processes in sense of larger integration, design a new Citizen Relationship Management model and services, master data management operating model and tools.

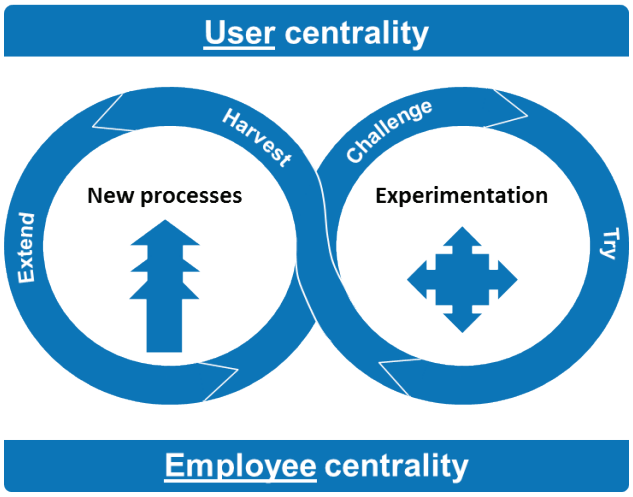
The digitalisation approach: a 'double-sided' continuous evolutionary process

The challenge of digital transformation requires the administration to manage two 'faces', that is to consider two different point of view: the users/citizens are on one side, with citizen asking for a user experience similar to e-commerce while medium and large business asking for increasingly integrated services with their own ICT systems, and the employees are on the other side, asking services enabling easier execution of tasks with some difficulty leaving the legacy. In this context, top management asks for increased efficiency and continuous improvement of quality, while aiming to minimise costs.

These two forces are constrained, but also somehow boosted, by European and national regulations about management of digital in the Public Administration, such the above mentioned "Codice dell'Amministrazione Digitale" (Digital Administration Code).

Such challenge can be won through an iterative process involving:

- **Process Re-engineering:** evolution requires re-engineering of processes leveraging on opportunities enabled by digital in order to guarantee the required level of services, provided both internally and to tax-payers, allowing at the same time a unified digital experience of citizens and employees;
- **Monitoring and simulation:** at the core of continuous improvement is a strong, but light, process of monitoring, consisting in process analytics, measurement of KPIs and simulation of change;
- **Optimization:** introduce workload management, dynamic allocation of resources and agile monitoring and control of office 'production';
- **Evolution:** processes can improve only if they go through a journey of evolution, enhancing automation and introducing advanced tools within process execution.



Users Side

Great effort has been made by the Agency in boosting the user experience and the overall quality and quantity of the services provided to citizens. 7 million users are registered; in 2017, we measured 133 million accesses to web portal, 27 million accesses to tax and cadastral personal area ('cassetto fiscale') and 49 million on line accesses to cadastral databases (92% of total accesses), 191 million documents have been received by citizens through on line services. A new version of our web portal was released in 2017, main on-line services are accessible through a native mobile app, while the Agency is also very active on the main social media platforms, where citizens can find useful information, latest news and answers to common questions.

Moreover, in compliance with Italian regulation, all web and mobile services are accessible through national digital identity systems (SPID), which allows citizens to access all public online services with the same digital identity and same credentials with guaranteed levels of security.

Another great success is the prefilled tax returns service which provides citizens with a "ready-to-send" form where all the information gathered by the agency has been used to calculate the taxes due by the citizen. The tax-payer can view, verify and, if some wrong or missing information is detected, modify the return. Data about corrections are collected and used to improve data quality and increase the number of not modified prefilled tax returns which are validated by citizens.

In 2017, about 2,4 million tax returns were sent on-line by taxpayers, while at June 2018 prefilled 730 models sent directly from taxpayers through the web increased by 22% compared to the same date in 2017. In 2018 about 918 million prefilled information have been collected and presented to users (157 million in 2015).

In line with legislation, the Agency invests a lot of effort in digitalisation initiatives, such as e-invoicing and new VAT services. While e-invoices to Public Administration is a stable process (mandatory since 2014 and involving 30+ million/Year invoices), e-invoicing is going to be mandatory also for private businesses: 1,5-1,8 Billion/Year Business-to-Business and Business-to-Customer e-invoices are expected, gradually starting from 2nd half of 2018 and beginning of 2019.

Agency Side

On the Agency side a great deal of effort has been spent in improving operational efficiency and in cost reduction. A key enabler to achieve these objects is to promote an increasingly and stronger integration between different process areas also involving, where possible, users' digital services. Process integration requires those processes to have a high level of standardization, which is only possible through a careful design, maintenance and evolution of a wide set of common base services. Great attention is also required in promoting a "mind shifting" in employees' culture and attitude, switching from a document focused approach to a process focused organization.

This transformation can greatly benefit from opportunities created by exploitation of data assets, maintaining at the same time high carefulness for information protection and security.

The overall approach of the Agency to digitalisation of internal processes requires two tiers of abstraction: a common level of base and standard services shared among several processes and organizational structures, and a layer of automation which implements the specific tasks required by the business process.

The full digitalisation is achieved by allowing the outputs of single process phase to be either solely or standard representation of data extracted from digital repositories, or digital documents, for internal processes, but especially to be sent to Citizens, for which regulatory compliance must be fully guaranteed.

The digital transformation journey, despite the great results achieved, is a continuous transformation process: currently, the Agency is at work focusing on several working areas:

- **Cross functional processes:** the Agency already achieved the ability to full digitalise all our administrative procedures. In this context the key challenge is moving from a "siloed" and fulfilment-centric view to a citizen-centric view: with first approach officers integrate the information through the administrative procedure, acting as process orchestrators, while with the second one officers work with unified cross-functional processes having a complete and certificated view of Taxpayer information;
- **Platform evolution:** the first objective is to enlarge the layer of common services while reducing layer of 'per-process' vertical ICT services; at the same time the Agency adopted Business Process Management practices and tools, in order to increase standardisation flexibility and ability to optimize workload.
- **Digital document management:** the Agency had already achieved a high level of digitalisation in document management, such as a structured set of common base services for native integration of vertical application; the 'Digital mark' for paper copy of original digital document, replacing manual operation of compliance verification and signing with a QR code; the evolution of existing assets for document management workflow and digital signature; the creation of a central repository of deputies in order to further reduce manual steps. Next steps involve re-engineering of processes with a digital first approach; keep on integrating applications, reducing redundant and specific solutions; Common services for automatic selection of best delivery method for formal notification, digitally where possible (e.g. to certified e-mail services - PEC), secondarily with certified paper copy of original digital document, depending on users' available data and preferences.
- **Master data management and data quality:** Within the information governance programme, quality assurance methodology and measures have been defined, based on international ISO standards, in order to measure, evaluate and improve the data quality.

Key challenges

Digital transformation is a long journey: legacy systems and 'old habits' do not disappear magically; there is no 'one ultimate battle' to be won, best approach is a gradual but no-stop digital process transformation, jointly with accurate compliance verification and change management.

Moreover some constraints apply: the core business of the Italian Revenue Agency requires deep vertical competence and cannot be fully automated, so there is constant research for better ways to implement the integration of human-based activities with automated processes.

Even if digital interaction with Users is growing fast (digital identity, digital address, etc.), it cannot be considered fully covered, so 'the paper option' must be considered in process design. Moreover, in order to reach transformation results, it is necessary to keep digital process transformation as the priority, even when it is not urgent.

Finally, one key challenge is about people and change management. We face diversity in the "digital attitude" of internal users, also in relation to organization level, role, etc.; this also applies to external users, which includes a wide span of individuals with different education, age, income, and so on. In the end, we need to fight against *"I've always done it this way"* through a proper communication of real benefits for both users and employees.

STAKEHOLDERS VIEWS

What do we mean by digital transformation of tax administration?

Peter Green

Head of the Secretariat of the Forum on Tax Administration at OECD[1]

Tax administrations have always been data driven organisations with the assessment of tax collection based on information on taxable events, assets or transactions. Collection of that information has changed over time with more sets of information being converted into digital form within the tax administration or, increasingly, arriving into the tax administration from taxpayers and third parties in digital form. This allows for faster and more efficient processing in most areas of tax administration from registration and identification through to tax assessment and tax debt management. The efficiency and effectiveness of these functions can be further enhanced through the use of aggregated data in analytics functions to uncover patterns which allow for better targeting and more effective and timely interventions.

But should we describe an increase in efficiency and effectiveness as a "transformation" or is it more of the nature of better "business as usual"? It is worth going back to the objectives of tax administration to consider this question. Arguably there is only one single overarching objective – maximising collection of the tax revenue that society has deemed necessary to provide public goods and services and to achieve wider societal goals. That objective, though, is subject to a number of highly important constraints, or principles, set by society. These principles can be described in a number of ways and will often be given different weights at different times. The core elements, though, are that the operation of the tax system should be even-handed and fair, burdens on taxpayers should be minimised and tax administration should be efficient and provide value for money.

Against that background, to be transformational the use of digital information, tools and analytics should lead to a step change in the level of compliance which – and this is the important bit - simultaneously minimises burdens on taxpayers, delivers enhanced value for money and increases public trust and satisfaction with the administration of tax across all taxpayer segments.

So what does transformation look like in this context? Perhaps it makes sense to begin by describing an end goal rather than the steps towards it, even if the end goal might never be fully achieved. In broad terms, a tax administration satisfying all of these conditions is likely to be largely invisible to the vast majority of taxpayers with tax taking place in the background in a non-intrusive and non-avoidable way. This is sometimes described as compliance-by-design. We already have such outcomes in parts of the tax system. VAT as paid by consumers is an example. It is just part of the price of the goods or services and generally there will be nothing more to do by the consumer. Pay-as-you-earn systems for salaried employees is another common example. Under PAYE there is withholding at source with relevant information provided to and built into employers pay-roll systems. For many in cumulative pay-as-you-earn systems, this may be the end of the story as regards that source of income. They will see the amounts taken out in their pay-checks but may have nothing more to do. In other systems, for example where expenses are calculated at year end, there may remain some adjustments to be made. Outside of tax administration, a good analogy might be the transformational jump to driverless cars. All the things we currently do to ensure compliance – speed cameras, traffic lights, road signs, traffic fines etc – might all just drop away. Compliance with the rules set by society – and there may be new rules allowing for example for higher speed limits - will be built in to the systems which operate the cars.

It is not difficult to imagine such compliance-by-design outcomes in other more complicated areas of tax, whether in the end-to-end process for micro and small businesses or as regards particular taxable events. It is more difficult as yet to see compliance by design for the largest businesses operating across borders, but that may change. The key issue is the extent to which the taxpayer's obligations can be captured by different data sources, processes and controls in a way which provides a certain outcome. The major constraint may well not be tax administration at all but rather tax law and the degree to which they produce black and white outcomes or shades of grey.

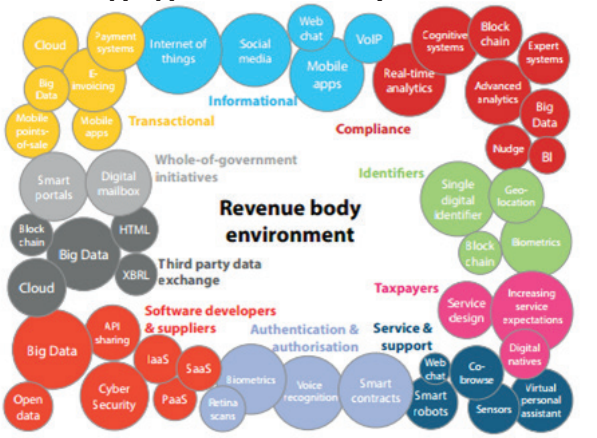
[1] The views expressed in this article are the views of the author and may not represent the views of the OECD or its members.

Of course such transformation in tax administration will not happen overnight. It is a journey requiring a number of steps and the first steps for many might be difficult ones against a background of outdated legacy systems, skills shortages and lack of resources. We are already seeing the start of this journey in almost all tax administrations with major shifts to electronic services, use of big data and analytics and increased use of robotics and artificial intelligence.

The prizes here are enormous. The 55 tax administrations, including many IOTA members, which are covered by the OECD Tax Administration Series (TAS) collect around EUR 8.5 trillion a year. While tax gap measurements are not carried out by all tax administrations, the amounts uncollected because of errors, underreporting, evasion, avoidance and uncollected tax debt will be a significant sum in both percentage and absolute terms. Uncollected and undisputed tax debt, which is measured in the TAS, itself amounts to EUR 800 billion, equivalent to almost 10 per cent of annual revenue. Other headline figures in the TAS are worth pausing on as well. The number of telephone calls received by the TAS tax administrations each year are around 300 million a year, the number of in-person enquiries around 130 million, there are around 60 million audits and verifications and tax administrations together receive around 500,000 complaints. And there is a big missing number – the cost to the economy of time and resources spent by business and individuals on tax administration, taking them away from activities which enhance growth and welfare.

Finally, a word on cooperation and collaboration. If we are indeed all heading towards the same place, then it makes sense to make the journey together and to learn from and help each other. There are a lot of potentially expensive dead-ends that we may help each other avoid and lots of successful practice that we can share. This is why the IOTA annual conference and its ambitious and wide-ranging work programme is so important and why joining up with other tax administrations, including through the OECD Forum on Tax Administration, CIAT and other regional tax organisations should perhaps be considered a priority.

The changing revenue body environment



Source: Australian Tax Office (2016)

Electronic Invoice in Latin America

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Introduction and framework

In 2003, the Chilean Tax Administration started a project to implement an Electronic Invoice System, in which taxpayers who voluntarily joined the system would prepare and send an XML based document that would be digitally signed and sent to both the buyer and the tax administration. The system was a success from the beginning as an increasing number of taxpayers were joining the system. A few years later, a group of tax officials from various Brazilian states went to Chile, looking not only for inspiration but for best practices and lessons learned in Chile. The challenge in Brazil was more complex because value added taxes are distributed amongst the three levels of the Federal government, with the State level being responsible for the larger part of the Tax on the Circulation of Goods and Services (ICMS). The political environment had previously evolved in a way that caused disparity between the development of the regions and created intense competition for investments, leading to a complex set of rules and formalities for both taxpayers and the tax administrations at the State and National levels. The electronic invoice started in Brazil with two key features; a compulsory character and a well-defined set of taxpayers. A few years later, CIAT started a network of electronic invoices that resulted in a valuable forum for the exchange of knowledge, experience and reciprocal support.

Since then, various tax administrations in Latin America have designed, promoted and implemented National Systems of Electronic Invoice. Although each version is different, there are a number of common elements worth mentioning:

- The Tax Administration designs and leads the system with the participation of other relevant government entities and active involvement with the private sector.
- The Tax Administration collects all the documents, not just the reports or summaries, but the entire XML document as generated by the seller. There are a few exceptions, in particular in Guatemala where third parties, that act on behalf of SAT (the Guatemalan Tax Administration), keep these documents which are only sent under request – a system that is being changed in order to adjust to the general method; and in Uruguay where invoices to consumers under the value of USD 1000 are summarized daily.
- The documents are digitally signed using the facilities of a PKI infrastructure. This characteristic gives the document the legal value it needs to be accepted for all purposes within the business environment. In addition, the digital signature of the XML document brings with it integrity and nonrepudiation.
- A set of regulations exist to define the characteristics of the operational model, the standard of the XML, the code-value tables, and domains that must be used within the jurisdiction by all taxpayers under the same circumstances.
- The adoption of the system by taxpayers only grows to a significant size under a compulsory mandate.
- The tax administration makes available a free or low-cost solution for small and mid-sized taxpayers to facilitate the preparation, sending and storing of electronic invoices. These solutions might be; a web-based application hosted by the tax administration directly, a standalone application that taxpayers could install onto their own computers, or, a limited but free service that is offered by authorized third parties to small taxpayers.

There are also some significant distinctions between the different electronic invoice models implemented in Latin America.

The operational model of the system is one example. In some countries, like the current system in Colombia, taxpayers send their documents to the tax administration only after they have sent them to the buyers. Therefore, the time limit for the taxpayers goes from a couple of minutes up to a couple of days. In other models, like in Ecuador, the seller simultaneously sends the documents to the buyers and the tax administration. And, in the case of Brazil or Mexico, the documents go first to the tax administration, or a third party that acts on its behalf, for validation or approval. This puts additional

pressure on computational and network resources and strengthens its resistance to failure.

Another difference comes from the tax system and the VAT legislation. All countries cover B2B operations and most of the B2G operations, but the B2C and C2C operations are treated differently. In some countries, like Brazil or Chile, B2C operations are supported by a different document while in other countries B2C operations use the same type of document as B2B operations.

The standard for the format also varies significantly, only Colombia and Peru use an XML scheme that is based on an international standard: UBL. The rest of the countries use a proprietary standard, meaning that Argentina has its own, Brazil has its own, and so on. Some formats include a large number of fields that can hold all the elements which might appear on an invoice, while in Mexico, there are a small set of mandatory fields with complements oriented for specific industries, so all pharmaceuticals would use the corresponding complement and all automakers their corresponding complement, et cetera.

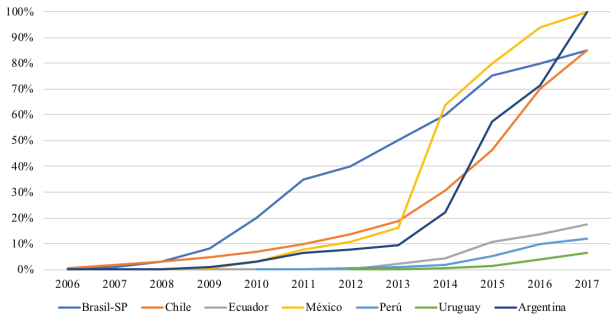
Scope of the Implementation

The successful adoption of electronic invoice systems in Latin America might be better explained with the following table that summarizes the total number of electronic invoices emitted and in possession of the tax administration since the start date for the current system.

The table indicates the number of documents by the end of April 2018. [1]

Country	Total Documentos	Total Documents AT
Argentina	7,160,939,584	7,160,939,584
Brazil	31,292,720,000	31,292,720,000
Chile	3,068,043,039	3,038,834,532
Colombia	2,660,444	2,660,444
Costa Rica	34,457,498	34,457,498
Ecuador	4,647,491,441	4,647,491,441
Guatemala	3,900,551,351	-
Mexico	28,114,610,859	28,114,610,859
Peru	3,468,894,145	3,468,894,145
Uruguay	2,491,944,091	321,124,280
Total	84,182,312,452	78,081,732,783

The following graph shows the accumulated percentage of taxpayers that have generated electronic invoices in certain countries since 2006. [2]



Advantages of the electronic invoice

There are significant advantages derived from the implementation of electronic invoices. For the private sector the benefits come from various directions. The first and most obvious being the savings that come from the abandonment of paper as its long-term storage, handling, printing or mailing are no longer necessary. Second, and more beneficial, is the ability to improve business processes, including those related to tax compliance, but also from the managing and operational side like accounts payable or accounts receivable, and, less natural but with great potential, improving the interface with ERP systems and the ability to inter-operate with other parties.

For tax administrations, the advantages are derived directly from an increase in control. The basic first step is to match the accumulated data from invoices delivered and received with the values declared in the VAT return at the end of the period. Then, with the addition of these systems, more sophisticated services are put into place:

- Immediate critique of VAT returns at the moment of filing where the system advices the taxpayer of any significant difference between what is declared and the totalized value of invoices.
- Availability of summarized information regarding the number and amounts of operations the administration has, either by a query to the system or by email, so the taxpayer can know what is needed before the preparation of the return.
- Since August 2017, the Chilean Tax Administration prepares the input and output registries for all taxpayers and pre-fills the returns for the majority of taxpayers with a current acceptance rate of over 80 per cent of taxpayers.

[1] Based on data provided by the tax administrations.
[2] Hernández Karla, Robalino Juan. Evidencias del Impacto de la Facturación Electrónica en América Latina. IADB – CIAT. 2018.

In addition, tax administrations have improved and created services to benefit taxpayers and the society at large. Some examples of these are:

- Better and faster processing of tax claims and refunds when, for instance, taxpayers can identify and select Income Tax deductions based on electronic invoices on his or her TIN.
- Support for factoring of electronic invoices, for the potential negotiation of a discount, thereby creating fast and affordable access to financing for small taxpayers.
- Provide anonymous or statistical data for other governments agencies to improve their results, including issues like a more precise estimation of sectorial GDP or the consumer price index.
- Availability of mobile applications that could help locate the best price within a 20 km radius for products that are identified by a common industry barcode.

Impact

The IADB funded the development of quasi-experimental studies based on statistical methods like the difference in standard deviations, propensity score matching and pipelining in Argentina, Uruguay and Ecuador, matched with the same efforts by the Mexican SAT. The studies were executed by independent researchers and it was confirmed, with positive statistical significance, that there is a favorable impact in terms of revenue from the implementation of the electronic invoice system. The studies are published and can be accessed in Spanish through the following links at the IADB:

- Argentina. Artana, D. y I. Templado. (2018). https://publications-new.iadb.org/handle/11319/8775
- Ecuador, Ramírez, J.R., N. Oliva y M. Andino. (2018). https://publications-new.iadb.org/handle/11319/8776
- Uruguay. Bergolo, M., R. Ceni y M. Sauval. (2018). https://publications-new.iadb.org/handle/11319/8774
- In addition a summary chapter of all models in Latin America and the impact in revenue can be read at the CIAT library: "Electronic Invoicing in Latin America: English Summary of the Spanish document / 2018", edited by CIAT and the IADB.

Why some tax technology transformation projects go off track?

Eelco van der Enden

Tax Administration Consulting, PwC Partner

1. Introduction

Everyone involved in tax agrees that the potential of technology for supporting tax compliance is huge. Whether you are an auditor, lawyer or controller at a multinational company (MNC) or accountant in the public sector. Whether you are a tax adviser providing legal services or a public accountant, assessing and validating tax positions in statutory accounts. However, when it comes to qualifying and quantifying the benefits of technology for the profession sometimes an eerie silence follows. That technology should enable tax professionals to have easier access to better data is deemed a given. How to make that really happen is often the big unknown. It is at the start that digital transformation projects often go off track.

In this short contribution, I will share some experiences and personal observations on why some tax technology transformation projects fail. Not only at the level of tax administrations but also at MNC's and tax advisory firms. I express the hope that, even if you disagree, this contribution may open up a healthy discussion amongst professionals dealing with digital transformation of tax in whatever form. Why? Because society demands us to become more successful in managing and enforcing tax compliance.

2. We assume a lot

When it comes to technology and tax we 'assume' a lot without having any empirical evidence or a predicting analytical model calculating what the effects of the introduction of technology are. Effects in additional revenue, saved hours, faster returns, easier collection, more impactful communication just to mention a few. That may have to do with the fact that the combination of technology and tax is relatively new. More and more non-classic tax professionals without a tax law background become important in the tax compliance value chain. However, they do not (always) understand tax. Even up to the level where we see that the difference between indirect and direct taxes is unknown. On the other hand 'classic tax professionals' have been trained in tax law but are not familiar with the concept of algorithms, artificial intelligence, unstructured data. Alas, I know tax directors of large businesses that perceive Excel as state of the art technology and tax partners at tax law firms that deem a digital newsletter for VAT a technological 'innovation'.

I think here our tax education system is at fault. Universities and accounting education programs still very much teach in ways when I went to university in the mid 80'ies of last century (indeed, with most of the same books!). The vast majority of the professors and teachers does not bring technology into the context of tax. As a start, to bring technology into the orbit of tax education programs, 2 questions should be answered by academia:

- What are the advantages of technology for the profession and society?
- What is the practical impact for the profession?

In this way education programmes will embed 'technology thinking' in the colloquium right from the start, thereby educating 'tax professionals for the future'. Universities should become more innovative when it comes to tax and technology. In fact, the whole concept of tax assurance, tax control framework, tax governance, tax compliance, etc. is not even at its infancy yet at most universities. But alas, as long as the 'interpretation of the law' and 'jurisprudence' is seen as a superior art in tax at the level of universities and tax advisory firms, this may not happen soon. We love to be succeeded by people 'like us', don't we? What we 'understand' we think we can 'control'.

3. Conquer fear

Let us be perfectly honest. 'Older people' are not that technology 'enabled' as younger people. I am in my mid-fifties. If I see how my children are using their i-Phones compared to me, I am using most likely only 20% of its full potential. My kids are 21 and 18 years old. However,

I have a friend with a 4 years old daughter that uses an i-Pad and i-Phone like I used my Lego train 50 years ago: as a toy in a natural way. Learning by playing is the best way of education. We have to admit that there is a 'generation gap' when it comes to fully understanding the potential of technology. Older people like to stick to old habits. They are afraid of the 'unknown'. Do you still print all your documents and articles and put them in a paper or plastic binder, carrying them around – mostly leaving them unread?

In addition of course, we know that within tax administrations the age of the workforce is on average higher than in private business. This is putting pressure on digital transformation projects. They do not always yield what was expected because of the 'human factor'. Behavioural psychology was not really thought through very well. Before you start implementing new technologies, make a thorough assessment of the people that have to work with the new technology. See to it that proper training will be provided and if needed personal coaching, considering different generations and thus a different approach.

It is not only the fear of not being able to operate technology by itself that counts. It is also the fear of losing one's position. To be made redundant and being replaced by 'a machine'. It triggers a negative sentiment around digital transformation projects. People feel like that Turkey that is invited for Christmas. Why should I speed up my own end? Mistakes, real or perceived, are being blown out of proportion in order to undermine the transformation. If employees of any organization are not from the start co-owners of the project, it will meet serious resistance. In order to avoid this, be transparent. Make people part of the reasoning behind the decisions concerning their own future. If the technological transformation project will indeed affect positions of some, offer serious alternatives. In fact, it is nothing new. Did we not see this with the introduction of the 'Spinning Jenny'? Were trains not to cause 'sour milk' with cows standing in pastures near train tracks?

Speaking of fear. What we have come across many times is the 'data security argument'. The data security argument is often used as a 'blocker' not to change current processes or implement new technologies (like cloud solutions). I like to compare the 'data security argument' for non-change with that trump card for (some) MNC's and (many) tax advisers against Public Country by Country Reporting – disclosing company secrets. What the 'data security argument' is for the public sector to block change, is 'company secrets' for the private sector. Both are very feeble arguments. Taxpayer data is not more secure because you can see a server in the basement of the tax office building (in fact it would be safer in the cloud). Equally, no secret formulas are disclosed when publishing country tax information. What a pitiful CEO I would be if I would be dependent on public tax data for my business intelligence on competitors!

4. Silo's

You have to see tax technology transformation in the broader context of the compliance (enforcement) strategy of your organisation. Unfortunately, we frequently come across projects that have been developed in splendid isolation. The strength of technology comes to its full power when implemented to support a 'functional process' within a clear strategy of the organisation with sound objectives. Only then are we able to create interoperable infrastructures and enable the organization to leverage from the various technology initiatives. That means that we need to analyse the current status of the organisation and its processes first. If not, and the underlying processes are not efficient, you may end up with automated dysfunctional processes…

Be aware that a broader digital strategy is linked to your:

Audit approach & methodologies	Interoperability of systems
Data security	Third party business relationships
Transparency agenda	Out- co sourcing agenda
HR Policy	Legal environment

Etc.

In fact, going digital is the perfect moment in time to rethink or revitalise your strategy and rethink your organisation. Technology is not about 'buying' or 'developing' a 'tool' and putting it on top of the existing organisation. That is where we see some tax advisory firms go astray when it comes to digital transformation. They operate the same as before but offer 'tools' on top of the traditional legal service offering. In that respect the introduction of the tank in September 1916 on the Western front and the 'Red Flag act' of 1865 are metaphors too good to be missed. But that is a story for another publication.

5. Silly promises

What you learn in business when negotiating a budget or your KPI's, or even when playing the markets at the level of corporate communications is:

'Under promise, but over perform'

It is good for your budget, bonus and share price. People do not like negative surprises. Some analysts do not

like 'positive surprises' but they are received far more positively than 'negative surprises'.

Somehow, looking at technology projects with tax administrations (or transformation projects with tax administrations in general) we see exactly the opposite:

'Over promise but under perform'.

For some reasons technology projects at tax administrations suffer (perhaps under pressure of politiciansannual budgets cycles or other reasons) from unrealistic expectations. I see in my practice project plans with completely unrealistic timeframes, very inadequate budgets and inflated expected additional yields and outcomes. 'If we do not tell a highly optimistic story, we may not get any budget at all' is the reasoning. It is a deadly trap for the administration's credibility. It puts a mortgage on future digital transformation projects at the tax administration.

Let me be perfectly honest: Digital transformation is not easy. It is new. It takes time (3-5 years depending on the scope). It is expensive (yes, it is). Things go wrong (they will, from time to time). However, it is inevitable. As tax administration, you cannot lag behind. If taxpayers do online banking transactions, order goods via internet and set up digital businesses themselves, you cannot keep sending paper returns, only answer question from Monday 9.00-12-00/13.00-17.00 to Friday 9.00-11.30. We all know we have to change and go digital. Society expects us to keep pace. So better, be perfectly honest about it to our superiors, politicians and society.

Summarized: it is a nasty, expensive and sometimes painful process. But in the end it will be rewarding. My wife compared it with having a baby, which comparison I accept to be highly inappropriate indeed.

6. Good intentions, wrong people

Digital transformation of tax is about 'business transformation'. Unfortunately, somehow because it contains the words 'digital' and 'tax' we see transformation projects being managed by either technological geeks or brilliant tax technicians. Alas, both are usually not God's gift to change management. Be sure that the team responsible to make it work consists of the right people with the right skills. We see sponsored projects for digital transformation managed by former senior tax officials or pensioned-off tax partners of tax advisory firms. They are asked to manage a digital change project they have no experience with, their 'own administration' still in the 'fax-age'. The fact that you know how a tax administration works from the inside is a big (necessary) asset. Knowing BEPS or tax treaties is a useful asset. But it does not mean you understand digital transformation. On the other hand, bringing in top technology people with no affinity to tax audit, tax systems or the essence of taxpayer centric strategies will not work either.

In fact, we see the same issue at MNC's and their tax advisers. Tax lawyers advising on digital transformation and tax control frameworks without even the basic knowledge of COSO[1], COBIT[2], financial risk management process and workflow management. Advice is usually provided to meet the 'legally required minimum' without understanding what it really means to build proper governance and infrastructure around a strategy.

Make sure you have the right people on board to make the transformation happen. Yes, also if these people come from outside the 'usual service providers circle' or other old friends. New times and technologies bring new people and service providers.

7. Conclusion

In this short contribution, I tried to give a non-academic overview of some critical issues we have come across in the recent years. For both tax administrations, MNC's as well as tax advisory firms, digital transformation of tax is not easy. Why? Because in the end, how digital it all may become… it is about people's behaviour.

If the people of your organisation believe in digital transformation and support it, you've won half the battle. If you do not take all aspects around digital transformation into account, you will move 'blindly' into unknown territory. The price you may have to pay for that could be high.

[1] Committee of Sponsoring Organisations of the Treadway Commission – enterprise Risk Management – Integrated Framework
[2] A framework for the governance of management and enterprise IT

Optimise your risk identification and management processes by blending external company information with your own tax data

Maqbool Lalljee

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THE VIEWS EXPRESSED IN THIS CHAPTER ARE THOSE OF THE AUTHOR AND DO NOT NECESSARILY REPRESENT THOSE OF BUREAU VAN DIJK.

1. Introduction

Tax administrations have been facing pressure from the electorate and media to combat tax avoidance and profit shifting away from their jurisdictions.

Responding to this, G20 countries through the Organisation for Economic Co-operation and Development (OECD), and the Base Erosion and Profit Shifting (BEPS) project, have delivered a framework of 15 action plans to equip jurisdictions with tools to minimise the effects of tax avoidance and profit shifting. However, exchanges of data under Action 13 plan pose numerous challenges for tax administrations to make effective use of this information.

Large tax administrations have already been working to improve their information technology infrastructures, update legacy mainframe systems and develop large data stores that can be used to share and link data from multiple sources. Their aims are to run efficient tax risk assessment systems to recoup tax, but also to improve processes to deal with taxpayers' queries and claims for repayments. Work to update infrastructure isn't straightforward. Introducing electronic filings of tax returns, accounts and accompanying documentations has been costly both to the administrations and taxpayers alike. The BEPS initiative will also create additional costs.

Administrations are seeking resource cost savings, such as more efficient digitalisation and automation of risking processes. **Introducing "clean" international commercial data to blend with their own internal data delivers visibility of complex ownership structures and their global wealth. Enhanced capabilities will help administrations effectively use big data, including BEPS information, for robust risking models and complex analytics. This would allow tax administrations to close the tax gap and provide real benefits for their investments in modernising tax management systems.**

Combating profit shifting

There has been growing external pressure on tax jurisdictions to combat the annual drain of hundreds of millions of dollars of taxable profits to low-tax jurisdictions. Studies show the estimated global losses of corporate income tax to jurisdictions in the range of USD 100-240 billion. In relation to developing countries, USD 66-120 billion per year is lost (OECD, 2015). Following the publication of the "Paradise Papers", a public poll in United Kingdom found that 85% surveyed believed that it was too easy for large companies to avoid paying tax (Pegg, 2017).

External pressures have created internal pressures to improve risk management systems. Tax administrations are working to improve their compliance processes and to assure that they are working towards tax enforcement, modernising their tax-risk management systems and to improve the pipeline of enquiries for high quality cases.

The BEPS initiative, which began in 2013 and took a few years to finalise, has produced a detailed 15-point action plan. The goal is to help tax administrations establish coherence regarding domestic rules and cross-border activities. Another aim is to reinforce substance requirements in the existing international standard and facilitating a framework of transparency around corporate activities **(OECD, 2015)**.

The BEPS Action 13 plan has provided a three-tiered structure for transfer pricing documentation under master and local files, and country-by-country reporting (CBCR), which has provided some visibility around cross-border activities. Increasing numbers of jurisdictions are imbedding aspects of BEPS recommendations in their tax code. Many jurisdictions are also becoming members of an "inclusive framework" and have commenced sharing this data in earnest.

This is a positive development in making tax administrators globally connected. Not only could data and knowledge around tax mischief and risk processing be shared, these initiatives could allow for quicker resolutions of data validation and corroboration. However, there are considerable challenges that many tax administrations face in terms of improving tax risk management systems as well as developing risk processes with resources available to make effective use of these disparate data sources.

Several tax administrations have embarked on a modernisation programme to update their systems and tax processes, as well as unifying direct and indirect tax systems under one administration. OECD cite some examples in its paper on comparative information on advanced and emerging economies **(OECD, 2017)**. Personal observation over the last few years would confirm this trend of automation and unification among tax administrations globally.

The need for data blending

All modernisation efforts must deal with existing legacy systems that contain vital data, especially sometimes archaic systems that house data across different heads of tax. Most of the data here has been added manually, which increases the risk of error. This data isn't in a "clean state" that could be matched and linked with important compliance information in other systems, for risk analysis.

With new arrival of CBCR data, it is highly probable, and personal experience of working with the electronic submission of XBRL (eXtensible Business Reporting Language) tagged data suggest, that there would be reliability issues with data in terms of provenance. There would also be problematic data gaps, incompatible formats issues and late filings. Some jurisdictions for CBCR information, however, have late filing penalties clauses in their tax codes to deter this issue.

For tax administrations, it could be worthwhile to clean data and information in their vast datastores and align CBCR data for effective use. Administrations and OECD have made significant efforts to improve and make risk management processes more effective. Data blending with an external global data provider, such as Bureau van Dijk, offers several benefits. It makes it possible to match, link and validate disparate data from third parties and taxpayers and to also add relevant external data to aid analysis.

- Bureau van Dijk ID numbers contains digital signatures of jurisdictions' company identification numbers along with other possible link digits to provide a matching "spine". This allows users to clean and remove duplicate and redundant records and to match tax data to Bureau van Dijk's data resources.
- Bureau van Dijk's company information universe contains several hundred million global corporate records with linked information on shareholders and company officers (directors).
- Bureau van Dijk offers comprehensive global coverage of corporate hierarchies including beneficial ownership, with active and historical ownership links.
- Bureau van Dijk maintains many other datasets including:
  - around 23 million detailed company financials over several accounting periods
  - global M&A and intellectual property data
  - sanctions information linked to companies, its officers and beneficial owners
  - tax risk and transfer pricing data modules, and more

Blending tax administrations' data with data provided by Bureau van Dijk (Figure 1) allow all data within the jurisdiction's data marts to be matched and linked. This helps specialists and data scientists to develop effective tax risk models and provide additional powerful data for predictive analytics and data and text mining projects. It also allows specialists to run algorithms downstream to unearth aggressive tax avoidance schemes (Figure 3) and use analytical models (Figures 4 and 5) employing neural networks for visualising output (Figure 2). With a basic level of automation, errors would be screened and dealt with efficiently where electronic return data enters the risk management system upstream (Figure 1).

Data integration solution

In the examples 2 to 5, the only data used is from Bureau van Dijk's commercially available data. The examples are for illustrative purposes only.

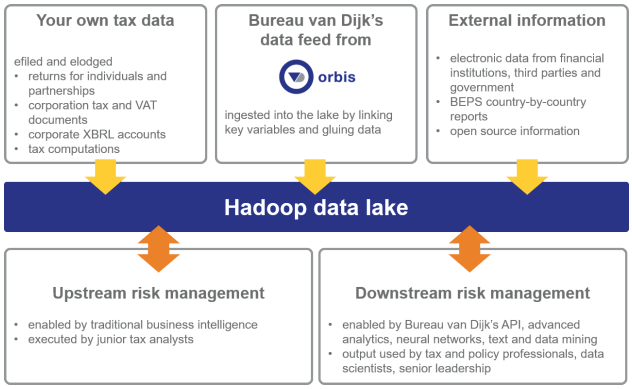

Figure 1: Example of the enterprise data architecture of a tax administration where internal data could be blended with commercial data to undertake upstream and downstream risking.

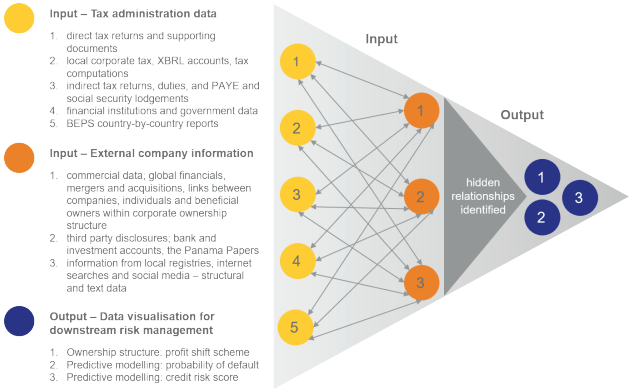

Figure 2: Example of a neural network that could be developed for advanced analytics where multiple sources of structured and text data from internal and external sources are linked. With clever algorithms, "hidden relationships" are identified through visualisation.

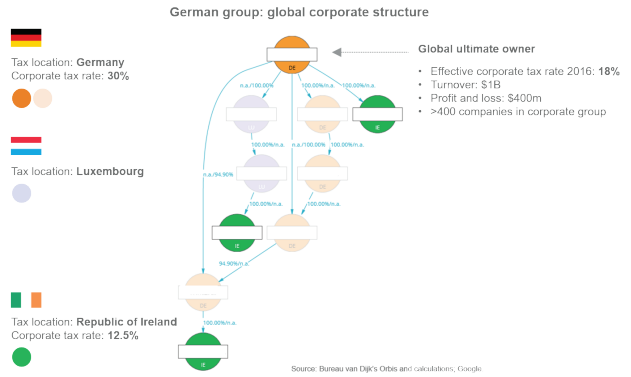

Figure 3: Example of a possible profit-shifting scheme. Here, algorithms are used to unearth a complex structure involving 400 companies where possible profit shift is identified from high-tax to low-tax jurisdictions. This could purely be a commercial structure where the intent is not tax avoidance. See the discussion in the Handbook on Effective Tax Risk Assessment on testing such scenarios (OECD, 2017).

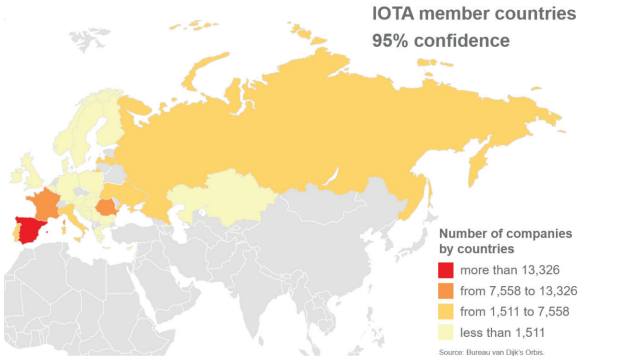

Figure 4: Credit rating model output: IOTA membership map showing number of companies by countries with 95% or greater probability of default with minimum 95% confidence level that these companies may go into default in a time horizon of 18 to 24 months. The darker colours show which countries are impacted most (base year 2016).

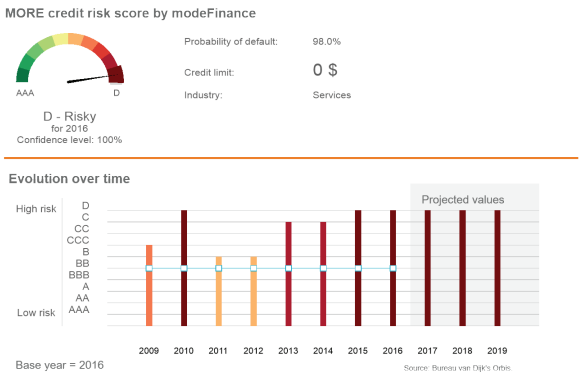

Figure 5: An output from one of Bureau van Dijk's credit risk models of a company within the IOTA membership area. This shows a probability of default of 98% and borrowing credit limit of USD 0. It also shows projected risk values post 2016. Monitoring such companies could allow for the development of a successful debt collection strategy.

Conclusions

Tax administrations face several challenges to modernise with the aim to optimise their risk identification and risk management processes.

To modernise:

- there requires a well thought out information technology (IT) and data strategy with a timeline for delivery, allowing for sufficient funds and resources to undertake the work and future-proofing the technology
- there is a need to establish industry expertise for IT to assist with data mart engineering and preparatory work such as migrating data from legacy systems where needed, undertaking data preparatory work and bringing in external data to add value
- expertise should be aligned within operations and policy areas to ensure requirements are fully understood by technologists. Developments are piloted and tested, involving subject matter specialists before going live

Modernisation doesn't necessarily entail digitalisation. A report on "Digitalisation of Tax – International Perspective" (**ICAEW, 2016**) gives insights into how digital technology is being developed by tax administrations with key lessons from case studies. Bear in mind that not all tax administrations are at the same stage of development. Not going down the digital route, as a panacea of reducing administration burden and closing the tax gap, doesn't mean they couldn't develop modern, lean risk-management systems.

All administrations' risking processes could be enhanced by blending external commercial data, as discussed in this paper. Technologically advanced administrations "ingesting" commercial data into their data lake could give considerable benefits from centralised, advanced analytics.

However, all administrations that take the data feed would benefit from global information. It would allow leveraging internal taxpayer and third-party data from regulators and public disclosures.

Above all, these processes would validate and corroborate CBCR data and information on ownership, financial information, intellectual property and their locations across the parent and subsidiary companies. Clever use of data with technology and expertise would optimize risk identification and management processes for all tax administrations.

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How Digital Engagement Challenges Revenue Organisation Structures

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Introduction

Order an Uber, book an Airbnb, reserve a restaurant table, pay your bills, buy that book your colleague just recommended—today it seems nearly everything can be done with a smartphone in mere minutes. And as the large platform companies, like Amazon and Apple, that provide these products and services continue to condition customers to expect convenience and efficiency, taxpayers are looking to their tax authorities for the same types of experiences. Tax administrations have been investing in automation and other digital technologies for quite a while, and now the capabilities of technology combined with the digital expectations of taxpayers are beginning to challenge tax agencies' existing organisation structures.

Digital platforms are evolving but are tax administrations?

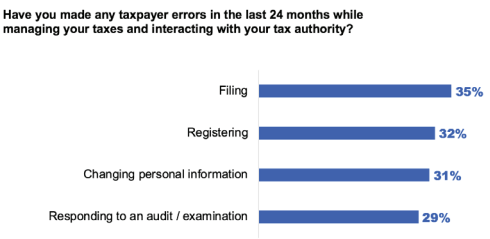
Digital platforms are increasingly complex ecosystems. E-commerce platforms are becoming media companies and offering banking services. Through advanced analytics and machine learning, private sector companies are personalising customers' experiences, recommending products and services based on their customers' interactions with them and their third-party partners. These companies are becoming more efficient and agile as they integrate procurement, manufacturing and logistics within their supply chain. Everything is automated and focused on improving customer interactions and loyalty.

While tax administrations around the world have automated services like filing tax returns online, data checks and call center response, many have not taken advantage of the potential productivity boost and cost savings enabled by new technologies such as artificial intelligence.

Accenture's 2017 Global Taxpayer Survey, which explored the experiences, attitudes and expectations of citizens from 12 countries, found that almost two-thirds of taxpayers report a positive attitude toward their tax authority; however, they desire more digital services, paperless correspondence and more seamless, personalised experiences. More than one-third are used to using artificial intelligence-enabled services from the private sector in everyday life. These statistics are significantly more pronounced among younger generations, those digital natives for whom submitting paper forms and waiting weeks for a response is almost unheard of.

Eliminating errors

Large economies lose billions in tax revenue each year due to avoidable errors made by taxpayers. The UK alone loses £8 billion a year.[1] Thousands of little mistakes become a significant burden on revenue agencies and taxpayers. Math errors and misunderstood information and form fields are the most common errors found before, during and after submission.



Younger people, the least knowledgeable about managing taxes, submit the most errors and would benefit most from digitally-enabled services, especially as more and more young people work in the digital, or gig, economy. In our research, taxpayers have said automated validation, live chat services and short informational videos would help reduce errors. A system that educates taxpayers, simplifies and personalises their experience will not only improve their sentiment towards tax authorities and improve voluntary reporting, but tax authorities can also mitigate costs and inefficiencies caused by errors.

[1] HM Revenue and Customs (2017). Making tax digital for business. https://www.gov.uk/government/publications/digital-reporting-and-record-keeping-for-business-income-tax/making-tax-digital-for-business

Dissolving traditional boundaries

Many longstanding ecosystems currently support taxation such as the ecosystem shared between taxpayer, employer, bank and payroll company for processing employee withholding tax. These ecosystems typically involve a combination of manual and automated processes completed across siloed organisations, and they often subject taxpayers to uncoordinated, time-consuming tasks. Fragmented processes also raise accuracy and compliance concerns.

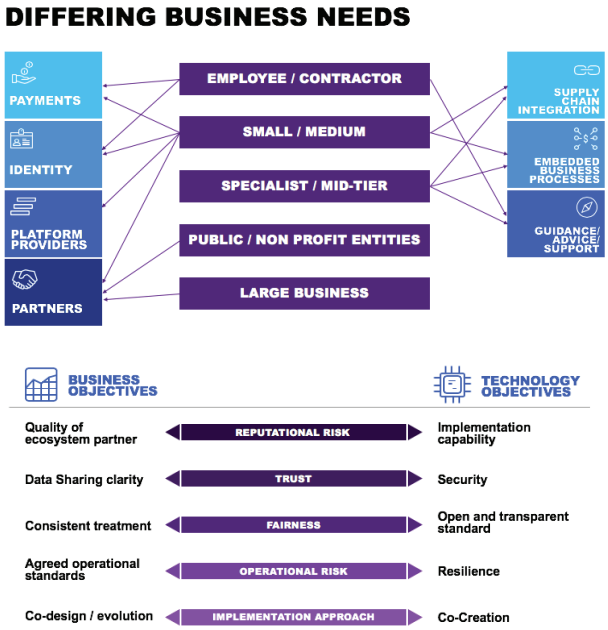
New technologies within digital ecosystems can offer an entirely more personal and convenient experience for the taxpayer while also improving compliance. They can coordinate activities between organisations to remove complexity, eliminate unnecessary reconciliations and complete processes in a much more efficient and cost-effective way. They also make it possible to integrate services, such as an online identification capability that gives the user access to different domains and platforms without needing to remember several different passwords.

The digital world offers the opportunity to remove traditional boundaries in taxation ecosystems as technology supports the sharing of data and processes by tax administrations with ecosystem partners, accurately, in real-time. Artificial intelligence and blockchain, in particular, open up collaborative opportunities within broader ecosystems by automating tasks, offering virtual assistance, and keeping immutable records.

Transforming tax organisations

To take advantage of the potential of digital ecosystems, tax administrations must consider a variety of perspectives while focusing on the taxpayer experience and assuring compliance. Administrations will also need to carefully balance their system design objectives with those of their ecosystem partners. Newly integrated ecosystems should support services that ensure taxpayer compliance and ease of use while also accommodating the needs of partners to serve their customers and promote their brand.

Customer-centric design is at the heart of all successful digital ecosystems. Ecosystems supporting taxation are particularly complex, involving many organisations besides the tax administration. The design of such ecosystems involves considering many perspectives: the taxpayer, consumer, business owner, and service provider. Tax administrations serve many different types of taxpayers from large businesses to students working while on summer vacation. Designing a digital experience to successfully meet the needs of any one type of taxpayer requires an in-depth understanding of that segment's needs and context.



Both business and technology functions in an administration must collaborate to direct the strategy for the ecosystem. While they share common concerns, they will bring different perspectives to addressing those concerns, each of which should be considered.

Current tax agency structures limit the effective management of the end-to-end taxpayer experience. They simply are not set up to manage and support accountability for the entire experience of a taxpayer segment. In addition, it is usually unclear who in a tax agency is responsible for coordinating with private sector third-party providers to create seamless experiences for a segment. Who will oversee this transformation and be responsible for monitoring and improving the customer experience over time?

Conclusion

The necessity of designing and managing the end-to-end taxpayer experience, covering both service and compliance in a digital world, raises fundamental questions about the ability of existing tax organisation structures to meet this need. While every agency has a unit responsible for large businesses, the evolution of similar units for other taxpayer segments seems necessary if agencies are to successfully take advantage of digital technologies to personalise and more fully automate engagement with the various types of taxpayers they serve.

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