

Tax disruption management

How to survive in the new world of tax



Abstract	3
<hr/>	
Executive summary	5
<hr/>	
Part 1 – Progress	9
1. Introduction: What is tax disruption?	9
2. Stages of tax disruption: What will the future world of tax look like?	11
<hr/>	
Part 2 – Priorities	14
1. What’s so special about tax disruption that it should constitute a separate discipline?	14
2. Who is responsible for managing tax disruption?	18
3. Why does tax disruption management need to become a top priority now?	20
<hr/>	
Part 3 – The Frameworks	23
1. Summary	23
2. The tax disruption risk framework (the ‘cube’): How to monitor the risk and identify areas for taking action	26
3. The tax disruption management framework (the ‘inverted pyramid’): How to develop a strategy and tackle digital transformation	38
<hr/>	
Concluding remarks	50
Appendix 1	51
Appendix 2	54

Abstract

Are you ready for the digital world of tax?

Digitalisation presents organisations with two fundamental tax-related challenges at the same time: not only must they transform their in-house tax functions to handle an increasingly complex business, but more importantly, they have to deal with transforming tax authorities as they embrace digital. Using digital technologies at scale on data digitised by the private sector will give tax administrations 'superpowers'. These new capabilities will bring transparency to the taxpayer-authority relationship, fundamentally changing it. This will uncover any tax-related incoherence and confront corporate taxpayers with many uncomfortable questions. If you're not ready for these two challenges, you'll experience the uncomfortable feeling of being disrupted.

The emerging 'high control' tax environment will expose organisations to new financial and reputational risks, and a raft of diverse digital requirements and regulations is also on its way. If these risks are not managed appropriately, costs of incoherence will arise and companies will find themselves in a difficult position, unable to align with regulations or engage with authorities on an equal footing.

Making the tax function fit for the challenges of the new world of tax requires all-embracing strategic, technological and organisational change, covering the following topics:

- Developing a consistent tax disruption and digital transformation strategy
- Shaping a global tax narrative, and ensuring your data tells the same story
- Acquiring new technology skills and tools
- Managing the transition phase
- Training staff and improving processes, and
- Changing mind-sets.

In our view, such multi-level and complex change and impact should be managed by assigning the task to a newly established discipline in its own right and giving someone responsibility for it. We think there should be a Chief Digital Officer for Tax.

Managing this change will allow you to prevent blind spots, uncertainty and redundant double spending later. A digitally enhanced tax function will enable you to increase planning security, gain new fiscal insights about your company, exercise better control and realise savings by exploiting the remaining room for manoeuvre in your tax optimisation activities.

We introduce two new frameworks to help you on this journey. Our *tax disruption risk assessment framework* (the 'cube') helps you determine *where* and *when* to invest in digital capabilities, addressing the prioritisation and resource allocation problem faced by many management teams. Our *tax disruption management framework* (the 'inverted pyramid') provides you with a blueprint for what to do at various levels of the organisation to actively mitigate the novel risks and, at the same time, reap the benefits of a technology- and data-enabled tax function.

With this guide, you'll be ready and able to prepare for the digital world of tax.



Executive summary

The familiar tax world is coming to an end. Decades-old tax frameworks around the globe are under intense pressure from all sides. Changing business models and new technologies have proven traditional models to be ineffective in dealing with the 21st century economy. How will these frameworks change, and how will technology revolutionise supervision? One thing's for sure: the relationship between taxpayer and tax authority will fundamentally change. If you aren't ready for this change, you will be disrupted when once-trusted tools and models no longer work for managing tax risk within your organisation. Only with robust management of tax disruption can tax functions be adequately prepared for the digital world of tax.

Digitalisation brings two fundamental tax-related challenges. Organisations have to deal with the digital transformation of tax authorities and, simultaneously, need to orchestrate the digital transformation of their own in-house tax function. Managing both transformations simultaneously is a significant task, but one that we think organisations can manage with careful planning and a little foresight.

In this guide, we address four topics:

1. We describe the fundamental changes that corporate taxpayers will face.
2. We explain why tax disruption will be particularly challenging.
3. We outline the benefits of acting now.
4. We outline a tool-set that will help you organise and manage this change.

We aim to provide valuable insights for those responsible for making the decisions that ultimately determine whether the myriad implications of digital tax authorities will be managed. In our view, this comprises a combination of board members, executive teams and heads of tax; those who are responsible for understanding macro developments, identifying relevant trends and then setting a risk appetite and strategy to ensure the organisation is ready for change.

What is tax disruption all about?

The use of data digitised by the private sector and the application of digital technologies on a large scale will soon give global tax administrations 'superpowers'. We are observing tax authorities in almost all countries embarking on significant investment projects to unlock these new capabilities. As a result of these capabilities, tax disclosures will no longer be the main source of information for authorities. They intend to derive new insights from other available data and build their own detailed picture of your company, its activities, value chain and substance. We read all these projects and pilots as hallmarks of a general trend. We are moving towards an age of tax transparency. The transition to this new world, if not managed, will likely expose

any tax-related incoherence. Are you sure all data available about your business paints the same picture as you do in your tax disclosures?

But there's more to it than that. As we move to this future state, the relationship with your local tax authorities will fundamentally change, from the way the authorities determine audit cases, the whole tax declaration and calculation process, to the area of damages and sanctions. The upcoming changes are so wide-ranging, complex and accelerated that the current set of tools used by tax professionals will soon be ineffective.

At the same time, corporate functions (including the tax function) in many organisations are embarking on a digital transformation journey. These transformation programmes typically focus on improving capabilities, increasing efficiency and freeing up capacity to fight the myriad fires that need to be fought on a regular basis, or simply to reduce costs.

All too often, these transformation programmes focus on internal 'quick wins', meaning they are often done on an ad hoc basis without a clear strategic plan. We think it's important to take a more strategic approach that keeps the transformation of external stakeholders in mind; you need to recognise that you're *transforming within a transforming environment*. If you only focus on internal needs and follow no broader plan, you will most likely be unable to meet the upcoming challenges that digital tax administrations will present, and end up spending more than you need to maintain compliance.

Much of the progress made by authorities to date is invisible to the outside world. Digital platforms with their long investment cycles take years to develop. Once ready, they can be deployed instantaneously, meaning that you will feel 100% of the impact once the switch is flipped. The cost of operation is also much less than the cost of development, so we predict that corporate taxpayers will soon be confronted with significantly more inquiries and probing questions from the authorities. To be ready to deal with this, tax functions need a different strategic approach and a specific digital-ready tool-set.

To summarise, what we're talking about is the uncomfortable feeling that you will get if you maintain an analogue tax function while engaging with digital tax authorities. This is tax disruption.

How will the new world of tax differ in the wake of tax disruption?

While the impact of these changes will likely be advantageous for taxpayers over the long term (more certainty, reduced compliance costs, etc.), the transition to this new world will confront organisations with a new

problem. The novel ‘high control’ environment currently being constructed by tax authorities will be driven predominantly by data and algorithmic decision-making. In simple terms, current machine learning and other algorithms are very good at identifying outliers based on incoherent behaviour.

For companies, it therefore becomes vital to build capabilities in time to make sure that they’re able to control their data and paint a coherent picture of business activity, by aligning the tax narrative for all tax types and jurisdictions to the underlying data. In addition to this ‘internal coherence’, companies must also be aware how their picture compares with similar organisations (‘external coherence’). Without ensuring coherence at both levels, companies run the risk of increased levels of scrutiny, additional tax audits and potentially even high penalties or refund denials, all because they don’t fit with the expected results. It will be challenging, but without a strategy to avoid these new costs of incoherence, tax functions could become a significant brake on business.

Separately, whilst tax administrations will demand coherence from taxpayers, they themselves are unlikely to be coherent across jurisdictions (indeed, we observe quite the opposite: look at SAF-T implementation across EU Member States). Tax administrations are creating different digital solutions, standards and algorithms, and are progressing at different speeds, to a different extent and with a different focus. The additional task of complying with the upcoming diverse digital requirements and regulations will be challenging.

What’s in it for business leaders?

We believe there are two reasons why business leaders should tackle this issue now.

The defensive case – dealing with the new digital approach to supervision: Tax disruption exposes companies to new and potentially significant financial and reputational risks by identifying incoherence that would otherwise go unnoticed. This could impair a company’s ability to meet overall business goals. Also, you have to bear in mind that the whole area is part of external stakeholder engagement, where demonstrating good corporate governance can have benefits when engaging with authorities.

The positive case – knowing more about your company: A digitally enhanced tax function will enable senior management to gain better fiscal insights into the company, facilitating better control and unlocking savings by exploiting the remaining room for manoeuvre.

For senior management, investing here should limit double spending later. In their approach to this topic, senior management need to avoid Kahneman’s ‘planning fallacy’ phenomenon, not giving investment in preparing a strong tax function the same priority as investment in exploring disruptive new revenue-generating opportunities.¹

What’s in it for the tax function?

Making the tax function fit for the digital world of tax will free up significant resources currently tied to manual compliance tasks – resources that will soon be needed in this changing tax environment. A structured approach will help the tax function align the tax narrative and deal with digital tax administrations and growing political and legislative uncertainty. In the end, it will make tax experts’ jobs easier and more engaging, and help them focus on the important fires to fight. At the same time, it will ensure that the tax function can stay ahead of the authorities when processing and understanding tax-relevant data generated by the business.

So what should we do now?

Tax administrations have been investing in and experimenting with digital technologies for some time. Their capabilities are growing, but are not yet fully operational on a large scale, meaning that we’re not currently observing any major changes, only isolated incidents. Everything feels pretty much the same as before, with incremental progress. But that feeling is giving taxpayers a false sense of inertia. The second that administrations fully deploy their systems, their view on your company will suddenly be very different. Once companies truly feel tax disruption for the first time, the best moment to invest and mitigate the risks has long passed. Just like tax administrations, companies will need some time to handle the challenge and develop solutions. It’s not about waiting and then quickly buying a product to solve the problem (that ‘silver bullet’ is unlikely to ever exist). Responding is about acquiring new skills, training staff, changing mentality, getting a handle on your data and transforming the whole tax function – none of which can be achieved overnight. So the time for action is now. We suggest that the first action you take is as follows:

If you’re a board of directors member: At your next board meeting, raise the topics identified in this paper, and ask management to provide you with a summary of how the business you oversee is being prepared for the impact of digital tax authorities. Think about the risk profile that you would accept within your organisation when it comes to engaging with digital tax authorities.

If you’re an executive: Speak to the teams responsible for tax and managing risk within the business. Understand their approach to quantifying tax disruption risk, and their plan for getting the business ready to ensure that you’re able to maintain the same relationship with the authorities as you have today.

If you’re a head of tax: Think about your own tax organisation. How do you deploy technology to ensure that you can continue to be in control of the tax risk of the business as business models change and authorities deploy powerful new capabilities? How will you ensure that your team has the capabilities to operate in this new world of tax, and how can you use technology to ensure they have enough time to maintain oversight of tax risk in the face of dramatically increased supervisory control?

¹ More on that topic later in Section 3 of Part 2.

How to organise all this change

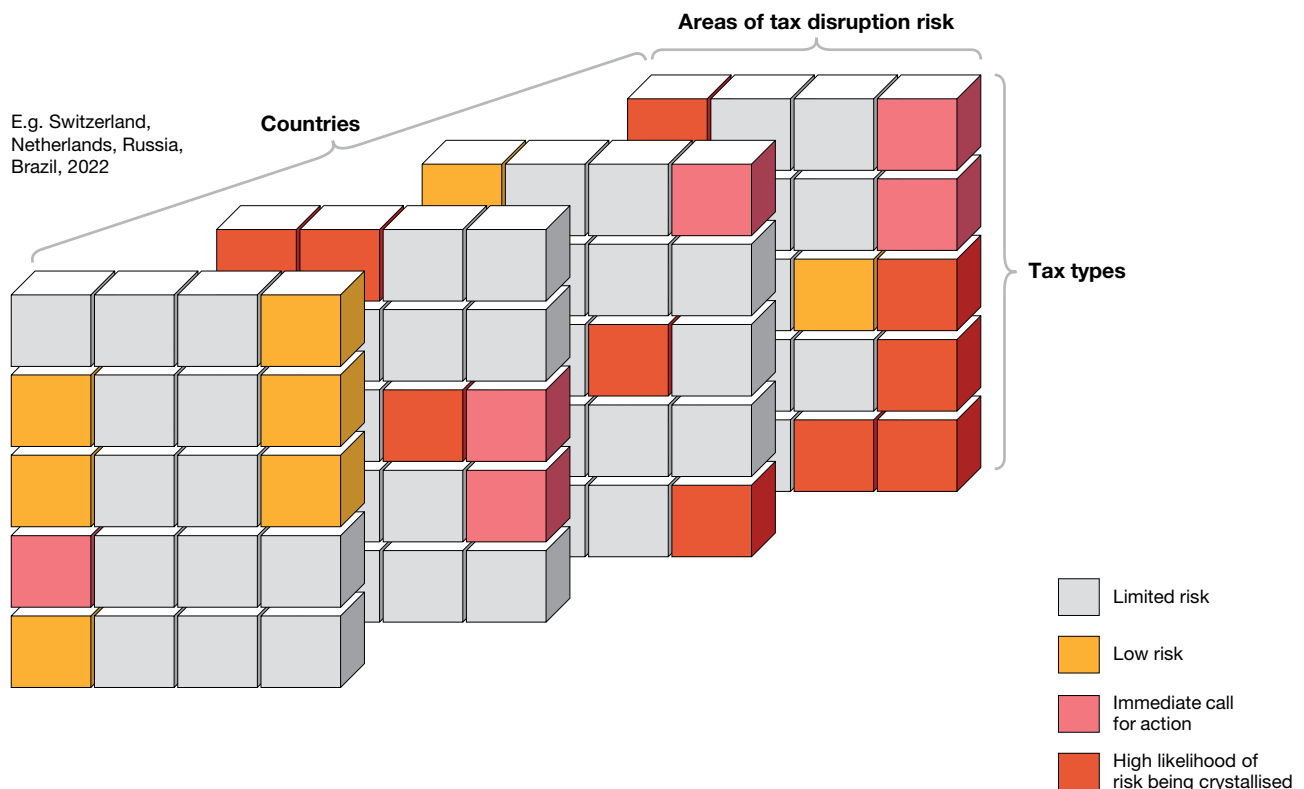
There is also good news in this whirlwind of change: Tax disruption isn't quite like other disruptions. It's different because it's almost 'plannable' disruption and is therefore manageable. The overall trend for tax is clear, so it's a lot easier than in other areas of digital transformation to prepare for and to take the necessary measures, especially if your company can already rely on strong and well-implemented tax risk management practices.

The bad news is that tax disruption still means a complex and diverse impact that requires all-embracing and complex organisational change. In our view, such multi-level change and impact should be managed by assigning the task to a newly established discipline and giving someone responsibility for it. Branding tax disruption management as a discipline in its own right allows you to win over the other functions to collaborate appropriately, coordinate the requisite actions, speed up the transformation process as necessary in a digital environment, and measure the change. By nature, the digital transformation process is so encompassing that most companies have appointed a separate Chief Digital Officer (CDO) as a new function to manage this process across the business. In a similar model, a 'Tax CDO' is required to manage the very specific nature of the change within tax.

When it comes to tax disruption management it's important to take a systematic and well-documented approach. That's

why we have developed the two frameworks that we'll be introducing in-depth later in this paper. Our *tax disruption risk assessment framework* (the 'cube') and our *tax disruption management framework* (the 'inverted pyramid') are designed to help you maintain an overview and carefully plan your next steps as tax disruption unfolds and the new digital and transparent world of tax emerges.

As an initial measure, our interactive² model of the 'tax disruption cube' is designed to help your organisation monitor and visualise the novel risks. Like a solid weather forecast, it's intended to prepare you for the likely future in the best way possible. Hence, the main goal of the *tax disruption risk framework* (tax disruption cube) is to strategically determine *where* and *when* to invest in digital capabilities. It should help companies deal with the *prioritisation problem*: the challenge of distributing limited resources to areas where action is truly needed. The cube also supports companies with the *timing problem*. It's hard to judge the perfect moment to invest. The cube helps show the areas where action is more urgent. In addition, it can be used as a *scenario planner* to estimate the outcome of different approaches. You can feed it with information on where you plan to progress and estimate the consequences in relation to the authorities and risk. Finally, the tax disruption cube can serve as a *progress monitoring* tool reflecting the development of both sides over time.

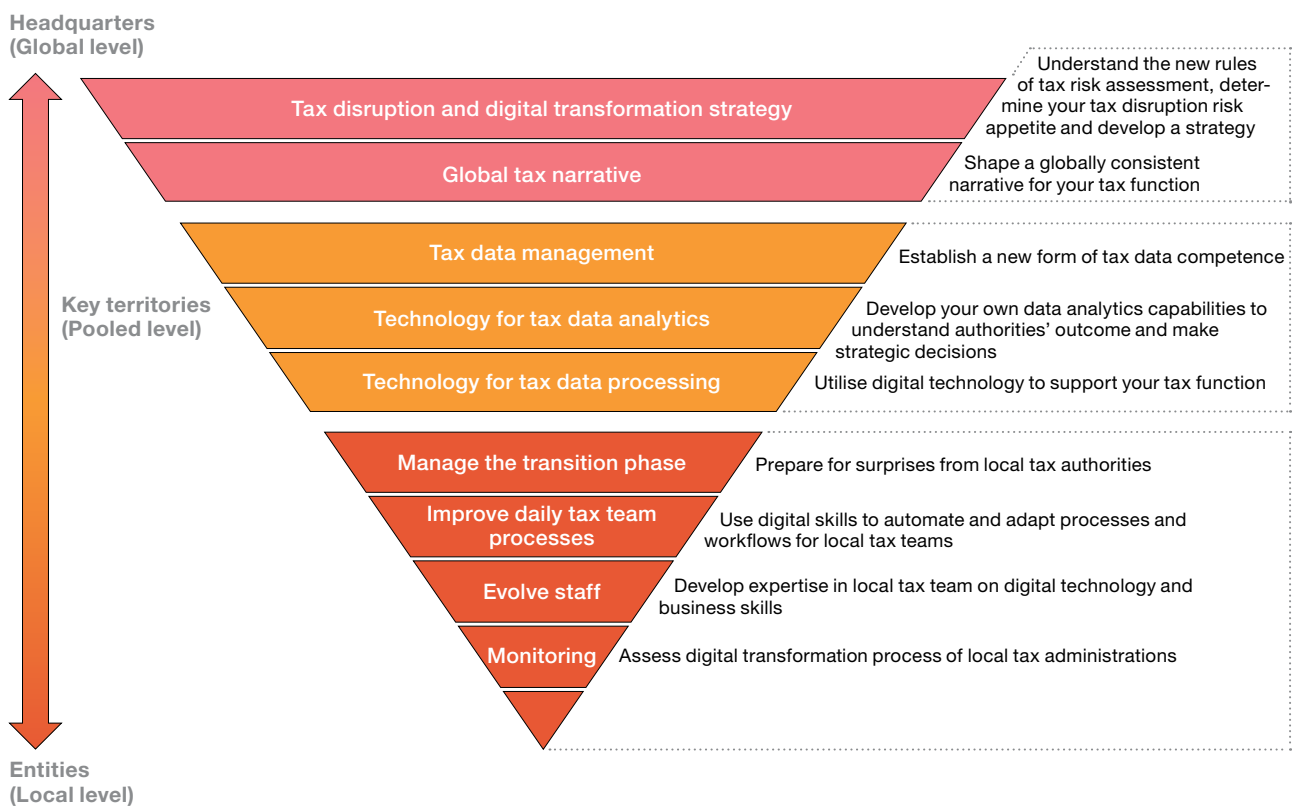


² For an example, see <https://www.pwc.com/taxdisruption>.



Unfortunately, it's not sufficient to have a solid weather forecast. You also need to prepare adequately and consistently for the upcoming weather situation. So, as the next step we propose our *tax disruption management framework* (the 'inverted pyramid'). This provides you with a plan pointing out what measures should be taken at what level of the organisation to mitigate the novel risks and, at the same time, reap the benefits of a technology- and data-enabled tax function.


Equipped with a solid weather forecast and a detailed roadmap, you should be able to face the upcoming climate change in the world of tax and feel less 'disrupted'.



Part 1

Progress

1. Introduction: What is tax disruption?



Tax disruption describes the fundamental changes brought about by the digital transformation of tax authorities and the feeling you will get as a taxpayer as you experience the impact of this new world of tax. You will feel this change sooner than you expect.

Digitalisation and disruption are key global trends in today's economy. As business and society digitally transform, they are laying the foundation for the next stage of the digital transformation process: the digitalisation of public administration.

Using digital technologies, public authorities will use digital data created by the private sector to build a radically different set of capabilities and a much-expanded sphere of influence. The volume of data processed, as well as the depth, breadth and velocity of analysis capabilities, will significantly increase, especially when it comes to control and compliance.³ Owing to their societal role as the funders of the public purse, tax administrations are at the forefront of this development. Many have embarked on significant investment projects to understand how technology can improve their approach. Soon increased data collection coupled with additional processing power will enable authorities to build a detailed picture of your company, its activities and value chain, dragging any tax-related incoherence into the open. The increasing amount of information available for processing means that we are moving towards an age of tax transparency with sophisticated and manifold analytics techniques and real-time access to business data.

The private sector will experience the consequences of this development as a new type of disruption, separate from the 'disruption' to business models often cited in business press and the media. The disruptive feeling will be particularly unsettling for corporate taxpayers. This is due to three specific hallmarks of tax disruption:

1. The tax authorities will be able to question the coherence of your company's tax narrative, across all tax types and jurisdictions, as never before.
2. The tax authorities' countless approaches to adopting digital technologies and defining 'standards' will result in a very diverse tax landscape that is challenging to understand and manage.
3. The speed of digitised data flows will significantly reduce the time to react to any incident.

The combined impact of these three hallmarks are what we have termed tax disruption.

So how should corporate taxpayers prepare?

First of all, it's important that you have your (tax) house in order (i.e. that your company can rely on strong and well-implemented tax risk management practices).⁴ In times of significant and rapid change, it is crucial to be able to build on a solid foundation.

Unfortunately, robust tax (risk) management will not be enough. In our first paper ('When the sleeping giant awakes...')⁵ and second paper ('What happens when the taxman gets superpowers?')⁶, we argue that the impact of tax disruption will be more comprehensive than anticipated by most, rendering obsolete the current set of tools used by tax professionals. The whole tax environment will change fundamentally; from the way the authorities acquire information, determine audits, and the whole audit and taxation process, through to the area of damages and sanctions. Even the way the authorities interact with corporate taxpayers will change. We are convinced that the upcoming changes are so wide-ranging that it is necessary to develop a new toolkit, to pool efforts and thus add another dimension to your current tax management approach. 'Tax disruption management' has to quickly become a separate discipline, with a high priority.

In this third paper we will therefore address the following items.

1. First of all, we will highlight the likely developments by describing the stages of tax disruption to make clear how comprehensive the changes will be.
2. Secondly, we will substantiate why tax disruption management should constitute a separate discipline, and why tax disruption poses a significant risk to companies that has to be addressed properly.
3. Thirdly, we will explain why tax disruption management should become a priority and who we think should own it within the organisation.
4. Then, we will introduce a tax disruption risk framework that allows you to monitor developments around the world, understand how these will affect you, evaluate risk, and identify areas for action.
5. Finally, we will present our tax disruption management framework, showing how to develop strategies and processes to be ready for the upcoming challenges, and how to plan the necessary steps for taking action.

³ We call this development the Zero Cost of Control phenomenon: enormous growth in productivity within the public sector enabled by the use of digital technologies that makes it possible to extend the scope of the authorities at almost zero cost, accompanied by a strong tendency towards the centralisation of power.

⁴ For more on this topic, see R. Russo (ed.), 'Tax Assurance', Wolters Kluwer, 2015; T. Elgood, T. Fulton and M. Schutzman, 'Tax Function Effectiveness', CCH Wolters Kluwer, 2008; T. Elgood, I. Paroissien and L. Quimby, 'Tax Risk Management', PricewaterhouseCoopers, 2004.

⁵ In our first paper, we elaborate on this trend from a more general perspective. We explain why large parts of the public administrations are particularly suitable candidates for digital transformation and why this development comes as almost a natural evolution. We tried to outline the broader consequences and emphasise why assuming that public administrations will be reluctant to adopt digital technologies could prove costly.

⁶ In our second paper, we describe in depth why the tax authorities are the first to embrace digitalisation and disruptive innovation on a large scale. We give examples from around the world to demonstrate that this development has started. For the first time, we substantiate why it is essential for companies to catch up with this trend, and specify the impact they can expect it to have.

2. Stages of tax disruption: What will the future world of tax look like?

Tax administrations around the world are starting to adopt digital technologies and innovations, but they currently do so in very different ways; they do it at different speeds, to a varying extent and with different focus. Nevertheless, certain trends are emerging, which we have distilled into six stages to illustrate the progress step by step. The stages are designed to help you appreciate a very complex and manifold development and to understand where you are on this journey. They necessarily simplify things to reduce complexity and allow corporates to decide where to act.

We want to emphasise that all forecasts are associated with some degree of uncertainty. To build this model we have had to rely on assumptions, especially for the more distant future, as you always will have to when making strategic decisions.

Although some assumptions may be disputed (and we welcome challenges to our thinking), we want to stress that we feel confident about the assumptions we have made. We have spent a great deal of time monitoring developments across the globe, and this work has helped us to identify macro trends with reasonable certainty. We are able to point

to illustrative examples supporting many of the positions we have taken.⁷

The stages we outline below are not completely fixed. They are interconnected; sometimes they overlap, sometimes they intertwine, and in certain cases some tax authority might choose to realise a more advanced stage first or to miss a stage. As tax administrations develop, the insights they gain will not grow linearly with more information; they'll grow exponentially. We will observe some kind of 'network analytics effect'. For example, the authorities are not only getting more information about your company, but also about your suppliers and buyers. At the same time, they are comparing the information for the different tax types, and so on. With all of this data, the authorities will be able to look at the same issue from many different perspectives to figure out plausibility.

On the next page we have summarised the common starting position in our six-stage maturity model for many authorities, and one of the final stages. Detailed descriptions of the remaining stages are in the appendix.



⁷ We provide a collection of examples of how the tax authorities are digitally enhancing around the world on our webpage: <http://www.pwc.com/taxdisruption>. We are constantly updating our collection..

Stage 1

Old, familiar world of tax

(Full description of all stages in the appendix)

Stage 2

Providing more information (Already the current position for many authorities)

In recent years, many tax administrations have proceeded to this stage unnoticed. Authorities have focused on unlocking new data streams with changes in disclosure regulation (e.g. new reporting obligations like Base Erosion and Profit Sharing ('BEPS') or mandatory e-invoicing obligations). Although these data are still provided by corporates (affording some control over the information flow), they provide the authorities with significantly more information about the operations of an organisation than was available previously. Authorities have also improved their supervisory capabilities. Risk evaluation is now often done by machine learning algorithms, which improve over time, while tax inspectors mainly focus on outliers identified by these algorithms ('technologically-enabled compliance risk management'). Algorithms are increasingly deployed to support the audit process to handle the growing amount of information available. Personal liability for company officials for incorrect tax returns is more common in the more advanced jurisdictions.

For business, this stage will not feel much different to the 'old world of tax'. This is dangerous, because progress in developing new capabilities goes largely unnoticed, with a slight shift in focus of the authorities being the only noticeable change. Companies or industry sectors not in focus before might suddenly appear in the spotlight, for instance. But, a general increase in the number of audits can be expected, given the reduced marginal cost of identifying audits made possible by digital technology.

Stage 3

Collecting more information

Stage 4

Automated auditing

Stage 5

Automated taxation and full transparency

Stage five is the stage of full transparency. The taxman has sufficient capabilities and access to data to calculate an organisation's tax burden without any specific reporting from the taxpayer themselves. The authorities will run fully integrated platforms, which extract data directly from the company's systems, intermediaries and open sources. At this level, taxpayers will stop preparing their own returns, with the tax administration taking over this job in many countries. We call this step 'automated taxation'. At the same time, ordinary audits and the process of tax audit selection will become obsolete. We will probably observe a shift towards an audit of IT systems, the integrity and reliability of data and the processes of data collection. Accordingly, the authorities will likely establish another layer of sanctions, ones that bite if corporate taxpayers fail to implement adequate data management processes to provide the necessary data in the correct format and within the specified timeframe. A by-product of this move towards data collection is an increased risk of cyber-attacks on direct data flows to the authorities. Corporates need to ensure this data exchange is secured to avoid becoming a victim of data stolen as part of the data exchange process.

It's at this point when taxpayers will feel all the consequences of the new world of tax. The tax authorities will now perform most of the tasks that were originally conducted by the internal tax function. This does not mean that the company's tax function has become obsolete – not at all. But its purpose will have changed dramatically. Instead of preparing the tax return, 'new' tax experts will have to ensure that the necessary IT systems are up and running and transport the desired tax-relevant data, for instance. They will have to certify the integrity of the data, oversee and steer the whole system, and maintain the tax narrative. At the same time, they will need to make sure that management understands the tax picture, monitoring and visualising the data for the board and executive.

Stage 6

The new world of tax

Assessment hallmarks

Tax Authorities

	Access to taxpayer data	Tax return preparation	Audit selection	Audit process	Sanctions/damage
Stage One	Tax return and other disclosures	Taxpayer	Risk assessment and prioritising mainly manually by tax inspectors, sometimes rule-based algorithm	Manual sample testing of data by inspectors (often on site)	Tax due + penalties for wrong tax return Reputation
Stage Two	Disclosures and wide-ranging mandatory reporting obligations	Taxpayer	Risk assessment by machine learning algorithm, prioritising by inspectors focusing on outliers	Sample testing by algorithm, manual sample testing by inspectors (often on site)	As above, adding personal liability
Stage Three	Vast own data collection capabilities independent from taxpayer	Taxpayer	Risk assessment, prioritising and selection by algorithm, supervised by inspectors, real-time auditing of everyone for some tax types like e.g. VAT (no selection anymore)	Extended sample testing by algorithm, sample testing by algorithm with directly extracted data (remote or on site), rare, selected manual testing by inspectors on site	As above, including extended personal liability, and risk of data loss/mismanagement by the authorities (including hacking of authorities' database)
Stage Four	Extensive information exchange: Including data from other tax types, other jurisdictions (automated) 'Network analytics effects'	Taxpayer	Risk assessment, prioritising and selection by algorithm, only partially controlled by tax inspectors; real-time tax auditing by algorithm for more tax types	Testing based on huge cross-function data collections by algorithm ('automated auditing'), mainly remote, rarely on site (fraud)	As above, adding risk of inappropriate data quality, unproven data integrity
Stage Five	Access to all data required to determine tax (direct data extraction; fully integrated platforms)	Authorities (automated taxation)	No selection necessary anymore, real-time tax auditing by algorithm with more information for all taxpayers and all tax types	Shift towards IT and process audit	As above, adding risk of inappropriate internal tax processes and risk of hacking of direct data flows to authorities
Stage Six	Including data from other public sector departments	Authorities (automated taxation, automated payment?)	Real-time auditing by algorithm with more information	IT and process audit	As above

Traditional methods
 Disruptive methods



Part 2

Priorities

1. What's so special about tax disruption that it should constitute a separate discipline?

In the last section, we predicted that the digitalisation of tax administrations will bring about dramatic change for taxpayers. The operations of tax authorities will transform fundamentally in the near future, changing the way they make decisions and giving rise to various and completely new areas of uncertainty for corporate taxpayers, with potentially negative consequences.

Often, internal drivers such as improved capabilities, increased efficiency and reduced costs are cited as the main impulse for tax function change. While these will drive gains internally, in our view the main driver of significant change will in fact be external to the organisation: the tax authorities and their (so far often hidden) digital transformation.

This can make tax disruption seem difficult to predict and something in which taxpayers can't play an active role. In this section, we present three arguments supporting our belief that tax disruption should be managed as a separate discipline within the tax function:

- a. Tax disruption poses a completely new risk with potentially high costs. At the same time, it catalyses familiar reputational and financial risks, accelerating the transformation of these risks and increasing the likelihood that they will crystallise. To prevent blind spots, this change agenda should be assigned to a discipline in its own right.
- b. Tax disruption is almost 'plannable' disruption, because the overarching trend is reasonably clear. If it is managed wisely and systematically, the relevant risks can be mitigated and opportunities can be seized.
- c. Tax disruption results in all-embracing and complex organisational change. Such fundamental change can best be addressed by assigning the task to a newly established discipline.

It should be noted that tax is ultimately a regulation that impacts all participants within an economy. Heavily regulated industries will experience similar developments across their sector due to improved technology; the participant-supervisor relationship will fundamentally change in many areas. The challenges we outline here for tax will therefore manifest with regulators, immigration bodies and even the courts. In addition, given the multiple overlaps between the different types of regulation, the data shared with third parties may also have some overlap. If you operate in one of these regulated industries, you may also want to think about how you will minimise duplicated efforts as you respond to change in multiple domains.

a. Tax disruption poses a new risk and catalyses familiar risks

The new tax disruption risk

The core objectives of a tax function are to comply with tax regulations and strike the right balance of tax risk and reward that sits within the overall risk profile of the organisation. Digital authorities have started to create a new ‘high control’ environment driven by data and algorithmic decisions. In this new environment, algorithms will gradually take over the job of interpreting and applying the law from human officials.⁸ From a technical standpoint, the current crop of algorithms, put simply, are very good at identifying outliers produced by incoherent behaviour. This shift will make a huge difference for companies, because in many cases it will not be entirely clear how an algorithm comes to its conclusions. In particular, this is the case for advanced machine learning with neural networks, but it is also true for other machine learning algorithms if the algorithm passes a certain threshold of complexity over time. Once the algorithm cannot be ‘understood’ or ‘debugged’ any more, it only can be trained further.

In this scenario, the authorities’ reliance on algorithms means that companies are exposed to a completely *new* risk that the algorithms misunderstand or misinterpret their business model or behaviour. The tax administration’s algorithms could interpret the data about your company incorrectly. With the ability to acquire more information, a lot faster, from many new and different sources around the world, and with the skills to scrutinise more taxpayers in greater detail, the tax authorities could paint a picture of your business model, substance and value chain that deviates from your own structure. They will also expose the incoherence of your tax narrative with your tax data, on a global scale. This could trigger additional tax liabilities, tax penalties, refund denials and/or delays eliminating the advantages of popular tax rulings, for example. Suddenly you may find yourself in the limelight, where you do not want to be, with difficulties to challenge the algorithmic outcome. Ruling out algorithmic suspicion will be hard, complex and time-consuming. To avoid such a situation, we believe that companies will need to build capabilities to ensure that they understand their data, and can ensure that it paints a coherent and appropriate picture of business activities. It becomes vital to try to adapt and align the tax narrative for all tax types and jurisdictions. Usually, tax functions are not prepared for this task, because quite often, different (‘shadow’) tax functions cope with different tax types in different jurisdictions. This means that one team may not know the tax narrative or approach used by another tax team.

Key question: Do you have a coherent view of your corporate tax, transfer pricing, VAT, customs, wage tax and sales tax positions in each of the territories in which you operate? Regionally? Globally?

Added to this, tax administrations across the globe will deploy *different* digital solutions and algorithms, creating the risk that they will look at the same set of data and reach different conclusions. This will make it even more difficult for companies to engage with multiple authorities across jurisdictions, and will increase the need to demonstrate a coherent picture themselves.

In other words, in the old, familiar world of tax, the cost of *incoherence* was limited. If tax-related statements differed slightly from jurisdiction to jurisdiction (supported by deviating data), this was not harmful in itself. The situation started to change with new regulatory measures like BEPS, Country-by-Country-Reporting and information exchange between tax administrations. This new situation already requires more coherence, but mostly with regard to the tax narrative that is reported. This is not even half of the forthcoming story. With digital technologies and new algorithmic analytics fed by novel and larger data input, the coherent tax narrative must be supported by coherent internal data (and third-party data). In the new world of tax, significant *costs of incoherence arise*. These novel and potentially very high costs pose a new and very important risk – so important that we decided to give it its own name: Tax disruption risk.

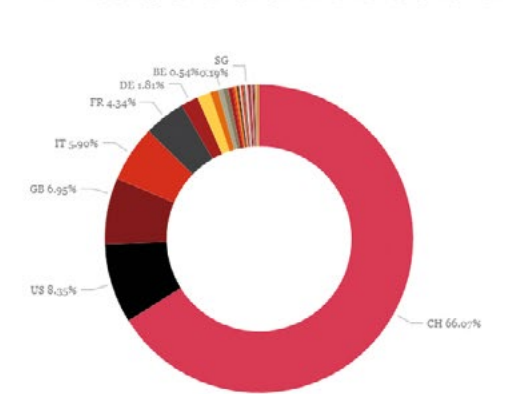
Let us present a very basic example to illustrate what we mean.

Imagine a tax authority collects openly available information about your employees on social media platforms such as LinkedIn or XING. There it will find information about your employees’ job position, their division, their job location, their skill set and so on. Based on this information, the authority could build a model of value creation within your company and compare this model with information you provided with Country-by-Country-Reporting. What are the chances that they match and you won’t have to explain any incoherence? You can imagine the same thing happening with openly available patent data, which contain not just the patent itself, but information about where the inventor is located, where the applicant is located, what entities are involved and how a patent is connected to other patents. You can also imagine the same thing happening with brand register data or news articles about your company, and so on, or even all these kinds of information merged in one model – and this is just openly available data!

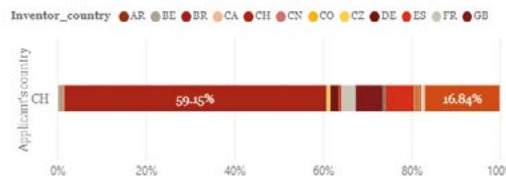
In addition, tax disruption catalyses familiar tax risks. In particular, during the transition to the new digital world of tax, companies’ primary objective has to be to mitigate potentially greater financial and reputational risks than they are used to.

⁸ The tax officials will instead take over other jobs within the tax administration like closer investigation, for example.

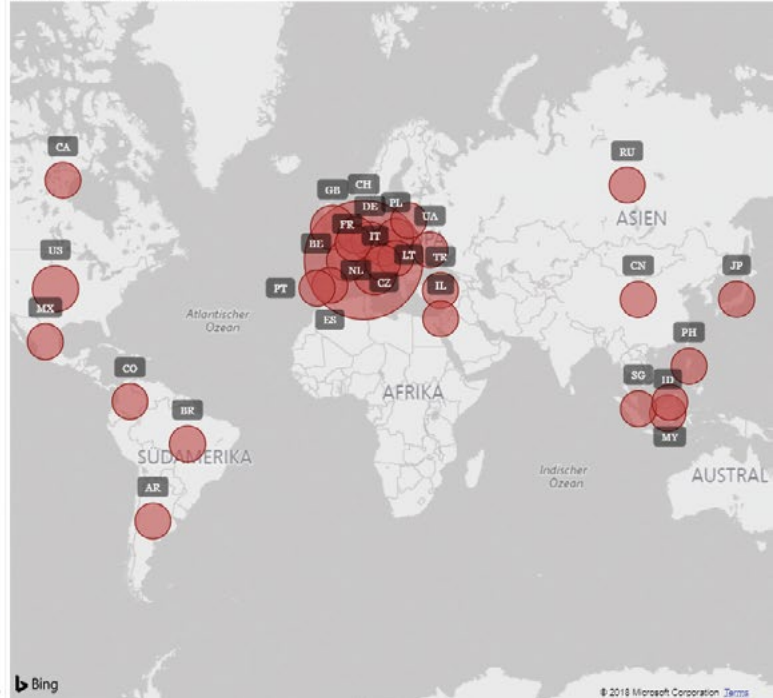
Inventor_weight by inventor_country



Count of Application number, First Applicant Country Matches Inventor Country and Invento...



Inventor_weight by inventor_country



However, the costs of incoherence do not solely relate to the interpretation of organisational data. Significant collaboration between national tax authorities in the development of consistent tax frameworks and policies has yielded a great deal of progress with respect to global standards, but we will see much less collaboration on the *implementation* of these common standards. Transparency and common rulebooks will set the level of taxation for a specific organisation based on principles agreed by all authorities. But how will the tax proceeds from a multinational be shared between authorities? Each authority is likely to determine its own share using its own algorithms, trained on local datasets. Will two separate models operated by two separate jurisdictions really agree on the split of revenues between the states? We think not. While some revenue sharing agreements exist in the form of double taxation treaties, they are open to interpretation and it is not clear whether they work in a digital environment (recent experience with the global internet giants suggests that they do not). In this situation, the only thing taxpayers can do is ensure coherence in their own data and respond to the tax authorities' incoherence with coherence.

The tools that once served you well will no longer be fit for purpose

It will be a great challenge for global businesses to adapt in all jurisdictions to stay compliant. It will be an ambitious task, for example, to prepare and disclose all the additional information the authorities demand, provide data in the many different formats and meet all the other different requirements of tax administrations in the digital age.

Failing here could already prove costly, with sanctions and increased compliance costs. Let's take an example. Without automated digital processes, your tax function will continue to respond to requests from tax authorities in a manual, time-consuming way. This works with a low number of requests from authorities, but what happens when the authorities use their new platforms to dramatically increase the number of these requests? Can you continue to operate if you receive, say, 400 automatically generated inquiries a day across the business? The cost (both financially and in terms of resources) will soon get out of hand. This is compounded by a similar change across all tax types and all tax jurisdictions in a short period of time. You will need to implement new tools just to stay on top of day-to-day compliance work, never mind the project-based work that you will also be involved in.

The taxman you used to know will change beyond recognition

As the tax authorities progress through the stages of maturity outlined in this paper, they will be able to extend their scope enormously. This implies that they will become a lot smarter, will know a lot more, and will be much more agile. Corporate taxpayers must consider how tax administrations draw their (algorithmic) conclusions and must be able to respond and argue on the same data-driven level. Hence, the challenge for business is not just to meet the new requirements and demonstrate a coherent tax narrative in the digital age. Companies have to develop skills in parallel with the authorities to engage with them at eye level. Without this understanding of how authorities work, it will be difficult to challenge their conclusions.

Herein lies another increased risk of tax disruption. Companies that do not prepare will be subject to unexpected claims from tax administrations and potentially high costs to settle disputes and differences of opinion with many authorities at the same time. Even more importantly, reputational damage can be suffered if these new claims are used to portray your business as a tax evader, rather than what is more likely a poorly coordinated and inconsistent tax narrative. All these risks significantly increase the likelihood of not reaching desired business goals.

Let us present another simple example to illustrate what we mean. Think of one of your products that's shipped worldwide. Then consider the number of different brokers and/or subsidiaries responsible for classifying this product for export/import, and how many different tariff classifications are possible for this product globally. There are likely inconsistencies here, but they wouldn't typically be considered deliberate tax avoidance. As soon as the tax and customs authorities start to exchange information and compare the tariff classifications for each product on a fully-automated basis, these inconsistencies will pop up quickly and the alignment of the tariffs might lead to substantial extra payments for custom duties.

b. Tax disruption is almost 'plannable' change and is therefore manageable

This leads us directly to the question of why tax disruption risk should be managed with a systematic approach.

Firstly, there is a great opportunity to mitigate the risk with the right approach and if timely action is taken. Unlike disruption in other areas, the overarching trend is clear for tax. When you know the end game, it's a lot easier to prepare for change. In essence, taxpayers must embark on the same journey as the authorities. The important point is that they have to stay ahead!

Secondly, it remains a multi-level development. Tax administrations will progress at different speeds and in different areas globally. They will deploy many incremental changes and diverse approaches, and increased collaboration will see the spheres of the different tax types and jurisdictions start to mingle. A systematic and structured approach is therefore crucial. Only then will you be able to identify the areas to act and allocate resources appropriately.

Thirdly, while uncertainty is often undesired and associated with risk (especially in tax), we want you to bear in mind that uncertainty always has two sides. Tax disruption is not only a hazard: it is an opportunity as well. In our view, the new digital tax environment will allow you to maintain a lot more planning security, to gain more and better (fiscal) insights about your company and therefore better optimise your company's tax position, exploiting the remaining room for manoeuvre.

c. Tax disruption results in all-embracing and complex organisational change

Your internal tax transformation process needs to be as detailed and comprehensive as the digital transformation process of the tax administrations with which you interface. It's not just about buying a new digital solution and implementing it. It's about establishing a completely new skillset relating to tax data and its management, shaping a new and coherent tax narrative and strategy, changing tax function processes, developing staff, and so on (more and extensive details on this topic in section 3 of Part 3).

How can you manage such all-embracing change and achieve these complex goals in large organisations? Only by assigning the task to a newly established discipline in its own right and making someone responsible for it.

In this way, you are able to attract adequate attention to the task to make it a priority and create enough momentum to stress the system, which is usually reluctant to change. Branding tax disruption management as a specific discipline enables you to encourage other functions to collaborate, to coordinate actions, to accelerate the transformation process and to measure the change. In addition, it prevents you from running into difficulties resulting from blind spots where this topic falls somewhere between the tax function and other business functions.

By nature, the digital transformation process is so encompassing that most companies have appointed a separate chief digital officer (CDO) as a new function to manage this process. We believe the same approach is necessary for tax disruption to manage the manifold implications and risks of internal and external use of digital technologies for tax.

2. Who is responsible for managing tax disruption?

We have now set out our justification for why tax disruption will fundamentally transform the tax environment in the short to medium term, giving rise to various and completely new areas of risk. This section seeks to identify the four groups of stakeholders who should have an interest in managing tax disruption risk and who therefore need to take ownership of managing this change.

The board

The board's view of tax risk management in general has changed in recent times, with directors taking a much more active role in the oversight of tax risk, considering both the benefits and costs of the various approaches to tax risk management, and setting acceptable risk limits with respect to tax. Among other things, this may be due to closer media attention and regulatory tightening in the wake of several 'tax leaks', increasing the likelihood of reputational damage. These days it's common for boards to have seen and considered a tax risk management policy to help them discharge this duty and evidence good governance. In the same manner, we believe they will soon be reviewing and considering a tax disruption management policy.

Board members need to develop their viewpoint with respect to the appropriate risk profile they're willing to accept. To do this they need to understand how the landscape is developing, what authorities are investing in and what this means for their oversight role. Awareness is important for this stakeholder group.

Executives: CEO or CFO

The executive level has to make sure that the board's targets are met by establishing appropriate tax disruption management. But, this is not the only reason for them to directly own the matter; there are at least four more. Firstly, as stated above, tax disruption poses new and potentially significant financial risks. If inconsistencies surface or new external requirements cannot be met, there is a substantial threat to the overall business goals of the company. Secondly, the tax function is dependent on the data that business units and other functional areas produce. Access to the relevant data has to be organised at C-level to ensure cross-functional support. Thirdly, tax disruption management and strategy need a greater degree of oversight, since a lot more sensitive data is going to leave the company and be presented to external parties. Last but not least, the whole area is part of communication with public bodies, where demonstrating good corporate governance might be desirable. These are all genuine areas where executives want to bear responsibility.

Executives need to speak with those responsible for tax and for managing risk within the business and understand their approach to quantifying tax disruption risk. They also need to plan for getting the business ready to ensure that the organisation is able to maintain the same relationship with the authorities enjoyed today.

Beyond that, the executive already has a key role in the ongoing megatrend of digital transformation and disruption. As the field of tax disruption combines digitalisation and common tax risk management, it is very clear that the C-level has a crucial role to play in tax disruption management, and that executives need to ensure that the relevant change programmes make best use of the business's resources and do not duplicate effort.

We are aware that the board's responsibility and level of involvement may vary depending on the company or country. Sometimes this kind of matter might be delegated to the CFO, while in other cases the CEOs themselves will become, or will have to become, more actively engaged. Nevertheless, the executive level must remain the key stakeholder in managing tax disruption.

Head of tax/tax function

The actual job of implementing tax disruption management falls to the head of tax.

As outlined above, the tax function will have to perform many different tasks to interface with digital tax authorities. It will have to be in a position to deliver advanced analytics and monitoring capabilities to visualise, understand and control the huge amount of new information relevant for tax. In the end, the head of tax has to tie up all the loose ends and be able to report to the executive level in a way that can be used as a basis for making strategic decisions. Simultaneously, the tax function is responsible for making sure the tax authorities get the information they request in the form they demand. It has to generate a globally consistent tax narrative and breathe life into the board's tax disruption strategy. On top of this, given the increased demands on its time and new requirements, the tax function has the most to gain from digitalisation, which will make its role easier and more manageable.

Heads of the function need to understand the resource levels currently required and forecast the future demands on the function (in terms of both the time and the skillset required) and reallocate resources to avoid drowning in a tide of compliance clarification requests from digital authorities.

Business units and functional areas

For us, it's important to emphasise that tax disruption isn't just a matter affecting the 'obscure' realms of tax and the boardroom. Digitalisation of tax matters goes hand in hand with the business's efforts to digitalise its activities and data.

The business has a responsibility to make sure that the tax function can source tax-relevant information easily and quickly on an automated basis. Functional areas have to guarantee that tax experts get data in a robust and consistent format that they can rely on. From a business perspective, this should not be regarded as merely another compliance obligation; it is also an opportunity. The tax function might deliver new and unexpected insights in exchange for the data provided, which could lead to improved performance from a tax perspective. More importantly, the automation process in this area can free up

significant resources currently tied up in compliance tasks. Once the systems are up and running, the business can focus on the things that matter to it most.

Here we have outlined four of the stakeholder groups for tax disruption currently existing within the business. Now we'll look at who should be charged with this specific change agenda. In our view, the change within tax is significant enough to necessitate the creation of a similar central leadership role, a tax disruption manager or 'CDO for Tax': someone who manages the implications and risks of the internal and external use of digital technologies for tax, and ensures that these internal changes are aligned with the broader organisational strategy around digital change. Without this role, it will be difficult to coordinate the resources required to deliver sustainable change without first suffering a significant issue with an external party (often the genesis of organisational change programmes).



3. Why does tax disruption management need to become a top priority now?

Having explained why tax disruption management should constitute a separate discipline and who should be responsible for managing it, now we need to look at why timing is crucial.

We have already outlined why tax disruption management is a candidate for top priority at board and executive level, as well as within the tax function. Even knowing this, it can be difficult for a company to distinguish the noise from the important signals and to choose between different priorities.

a. Tax disruption management as a priority

Board level

At board level the targets are clear. Any material topic that poses a major reputational or strategic risk to a business should be a priority. The fact that tax disruption poses new material risks with potentially high costs, as stated in Part 2, justifies placing tax disruption on the board agenda.

Executive level

The executive level takes a slightly different perspective, focusing on practical resource allocation. Putting tax disruption management high on the agenda means investing resources in the tax function – resources that then can't be invested in other functions that may create revenue, for example. Executives have to choose between four fundamentally different targets when making investment decisions: two 'positive' ones, and two 'negative' ones.

1. You can invest to increase revenue
2. You can invest to reduce costs
3. You can (and sometimes have to) invest to avoid shrinking revenue
4. You can (and sometimes have to) invest to avoid increasing costs.

Kahneman's 'planning fallacy' phenomenon describes the now famous 'optimistic bias'. When making management or planning decisions, humans display a tendency to underestimate costs and at the same time overestimate benefits.⁹ New research suggests that the 'optimistic' bias is one of the most important causes of risk for large-scale investment overspend.¹⁰ Not surprisingly, the urge to invest in targets number 1 and 3 above are therefore stronger than for targets number 2 and 4. It seems a lot more encouraging to invest in new projects that promise to increase revenue.

This might be one reason why it can seem easier to get funding for multiple projects in blockchain, which have an uncertain pay-out, than for tax technology projects that have a certain, but capped, pay-out. Nevertheless, the latter can deliver greater benefits, as *Kahneman* and other research have shown.

Tax disruption management means primarily investing in target number 4. You want to make sure that you're able to deal with digitally-enhanced tax authorities to avoid unexpected and undesired potentially significant costs. Simultaneously, it also can mean investing in target number 2: a digitally-enhanced tax function may be more efficient and cost-saving. However, the great thing about investing in tax disruption management is that it also addresses target number 1. Even in the new, transparent digital world of tax, there is some room for manoeuvre left to exploit with regard to fiscal efficiency. At the end of this section, we will present another example by way of illustration.

Tax function level

Being responsible for tax involves fighting many fires at the same time. This usually leaves little room for strategic thinking and long-term planning.

We often hear from heads of tax that they're concerned about growing political and legislative uncertainty. Regulatory requirements and actions taken by the many different tax authorities around the world are constantly changing. While the governments agree (sometimes) on the same rules at macro level, the application of the very same rules by tax administrations at micro level differs significantly from country to country. We have known for some time now what 'standardisation' means in the realm of tax and the challenge it presents to tax functions. Another topic that comes up repeatedly is the task of preparing for the 21st century regulation for taxing digital value creation, which appears to be on its way.

It's important to note that tax disruption sits above, and influences and intensifies, all of these topics. The upcoming 21st century tax regulation will not only find new ways to tax digital value creation; it will also allow tax administrations to make tax entirely digital. As already mentioned, digitalisation will also foster incoherence at micro level for applying tax rules, when the many different digital solutions and algorithms the tax administrations are currently developing are deployed. Even the standard audit file for tax (SAF-T) in Spain is not the same as SAF-T in Hungary.

⁹ See D. Kahnemann, 'Thinking, Fast and Slow', Penguin, 2012, p. 109 ff.

¹⁰ See, for example, B. Flyvbjerg, 'Over Budget, Over Time, Over and Over again: Managing Major Projects' in P. W. G. Morris, J. Pinto and J. Söderlund, 'The Oxford Handbook of Project Management', Oxford University Press, 2011, p. 321 ff.

Because tax disruption is the driver behind many trending developments and, at the same time, is a huge topic in its own right, we think a systematic, consistent and comprehensive approach embedding all these topics in one (tax disruption) management framework will help to address the issues best.

b. Timing is crucial

Many tax administrations started their digital transformation process a number of years ago. They have been investing in and experimenting with digital technologies, and their work has mainly gone unnoticed. Their capabilities are growing, but are not yet fully operational on a large scale. This means that companies are not currently observing any major changes. Everything feels pretty much the same as before, with incremental progress, but that feeling is giving companies a false sense of inertia.

As soon as administrations fully deploy their new systems,¹¹ their view of corporate taxpayers will suddenly be very different. By the time companies truly feel tax disruption, the best time to invest and mitigate the risk will have already passed.

Just like tax administrations, taxpayers will need some time to prepare themselves for this new world of tax. It's not about quickly buying a product that solves the problem (unfortunately). It's a lot more complicated than that; it's about acquiring new skills, training staff, changing mentality and transforming the whole tax function (more on that in section 3 of Part 3). This cannot be achieved overnight.

To make this more tangible, let's recall one of the examples from above: the product that is shipped worldwide and put into many different tariff classifications around the globe. As soon as the tax and customs authorities start to exchange information and compare the tariff classifications for each product on a fully-automated basis, inconsistent classification will attract attention. What will happen next? The authorities will demand coherence, i.e. use of the same tariff class worldwide. As a remedy for what essentially is non-compliance, the authorities will likely suggest the tariff code, applying criteria important to the authorities. What could have happened instead? A forward-looking, proactive company would quickly become aware of the classification inconsistency, giving it a little room for manoeuvre to choose a class to align criteria across the group. If the tax and customs authorities in this scenario then start to compare tariff classifications for all products automatically, the company would not 'pop up' as an outlier and therefore would be spared additional scrutiny in this area. Moreover, if one tax administration then questions the tariff classification chosen, the company potentially has a solid line of defence: all other tax administrations accept this class. The moral of this example is that if the tax authorities create coherence, it's usually more expensive for companies than if companies do so beforehand.

We are aware that this early investment requires a change in mentality, away from a reactive mode towards a proactive mode. We're also aware that this is hard to organise and justify, particularly while so many fires have to be fought right now. In addition, the process of the tax authorities becoming independent from the information companies provide, is a gradual one, making it less visible to management. This makes it impossible to judge the timing of your investment in this area – especially with uncertainty about the future as another major factor.

However, in our view, in the unlikely scenario that corporate taxpayers invest too early in the digital transformation of their tax function, this investment would not be wasted. A new digital tax function would still provide tax experts with faster and more detailed information and allow them to manage tax matters better, more efficiently and realise cost savings. This sounds a lot more promising than the scenario where companies invest too late and expose themselves to the high tax disruption risks described above. Climbers may never need their rope, but they can reach greater heights simply knowing it's there.

In other words: some time ago, everyone agreed that going digital is not optional, but obligatory. Lately everyone has accepted that going digital is a costly affair, but that if you don't play along and act too late, you'll have a problem.

¹¹ We call this the 'eureka moment of tax'. For more information on this see our other paper 'What happens when the taxman gets superpowers?': The consequences of the Zero Cost of Control phenomenon for your business.



Part 3

The Frameworks

The previous parts of this guide focused on what tax disruption is, what it drives, why it poses a significant risk and who should be responsible for managing it. It's time to look in a bit more detail at how to manage tax disruption.

1. Summary

In the coming years, tax functions will face two significant and interdependent challenges simultaneously: the digital transformation of tax authorities and the digital transformation of their own tax function. Using digital technologies, tax administrations will fundamentally improve their ability to control for compliance. This will have complex implications for companies and pose novel and important risks that have to be addressed properly. At the same time, for diverse reasons the tax function in many organisations is embarking on a digital transformation journey of its own.

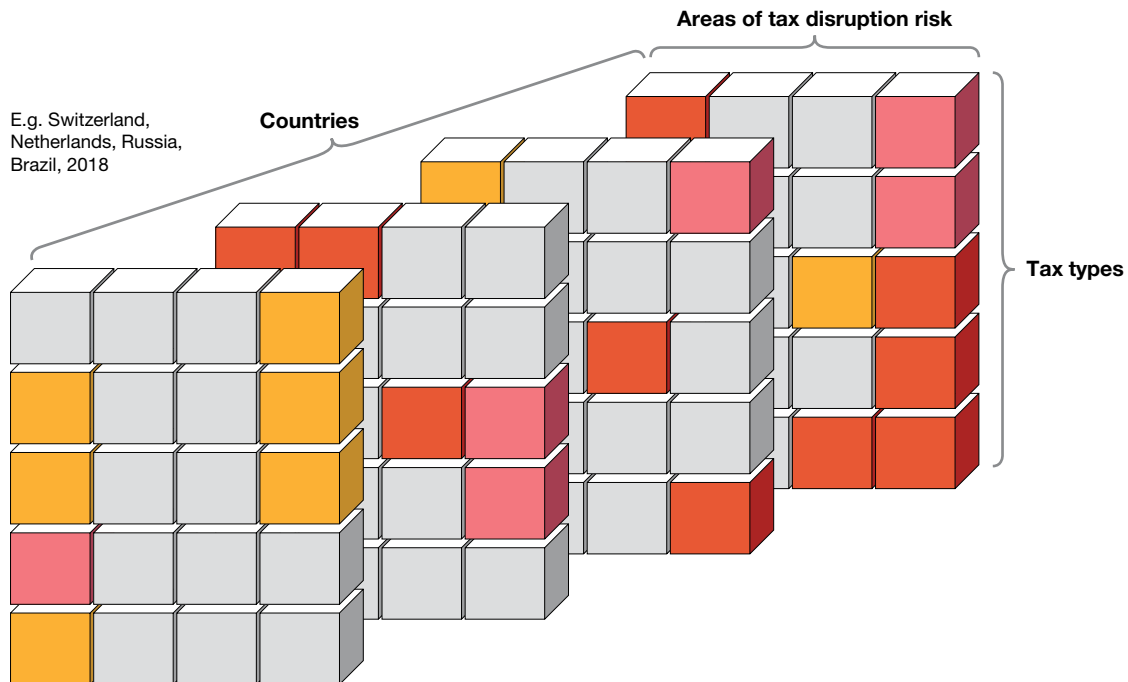
The resulting challenges for tax functions are significant and manifold, and they may seem a bit daunting. This is unnecessary. In tax, the overall trend is clear and the future bright. It's a lot easier than in other areas of digital transformation to prepare for and take appropriate steps. In the following, we will introduce two frameworks intended to take away initial fear of the topic by helping reduce complexity and organise all the upcoming change.

a. Tax disruption risk framework ('tax disruption cube')

The main goal of the *tax disruption risk framework* (tax disruption cube) is to strategically determine where and when to invest in digital capabilities, addressing the prioritisation and resource allocation problem faced by all management teams.

In our experience, areas of digital transformation within businesses are often defined by employees tweaking existing systems or by searching for politically acceptable 'quick wins'. Such changes typically focus on a very particular field, trying to improve internal capabilities, free up workforce or simply reduce costs. The novel and important risks that digital tax administrations pose are often overlooked or underestimated with this approach.

This has prompted us to develop the tax disruption cube to help you monitor these novel risks in a simple manner and plan your digitalisation efforts throughout the organisation. Like a sound weather forecast, it's intended to prepare you for the likely future in the best way possible. Although a weather forecast is never perfect, in most cases it helps you avoid the worst exposure. As we are convinced that prevailing weather conditions are truly going to change,



our model compares the progress of tax administrations around the world to your own planned digital capabilities. By differentiating for tax sub-type, area of activity and jurisdiction, the cube visualises where next to invest.

The outcome of this assessment is intended to uncover mismatches between the currently planned development path of your tax function and the expected improvement in the external environment. By doing so, the tax disruption cube aims to perform four tasks simultaneously:

1. It should help deal with the **prioritisation problem**: the challenge of distributing your company's limited resources to areas where action is truly needed.
2. The tax disruption cube helps companies address the **timing problem**. It's hard to judge the perfect moment to invest. The cube helps show the areas where action is more urgent.
3. The cube can be used as a **scenario planner** to estimate the outcome of different approaches. You can feed it with information on where you plan to progress and estimate the consequences in relation to the authorities and risk.
4. The whole assessment can serve as a **progress monitoring tool**. Rather than a single assessment, an annual appraisal of the cube will allow you to take account of new information regarding the approach of the authorities.

The *tax disruption risk framework* should put you in a position where you can see more clearly and prepare for the potentially extreme weather conditions in the new world of tax.

b. Tax disruption management framework (tax disruption inverted pyramid)

The main goal of the tax disruption management framework (tax disruption inverted pyramid) is to provide you with a plan pointing out what measures should be taken at what level of the organisation, to actively mitigate the novel risks and, at the same time, reap the benefits of a technology- and data-enabled tax function.

We have observed that digital transformation within a tax function is typically done on an ad hoc basis, lacking a clear strategic plan and a systematic approach throughout the whole organisation, and failing to consider the cost of such a patchwork approach. It's not sufficient to know the weather forecast. You also need to prepare adequately and consistently for the upcoming weather situation. If you're wearing sun block, ski goggles and rubber boots through a long heat wave, you might struggle under the conditions and realise you'd have been better off wearing linen clothes and a big sun hat and carrying enough water.

To tackle that issue, our tax disruption inverted pyramid provides you with a systematic, comprehensive and company-wide aligned approach to the digital transformation of your tax function.

The model broadly distinguishes between three categories of measures.

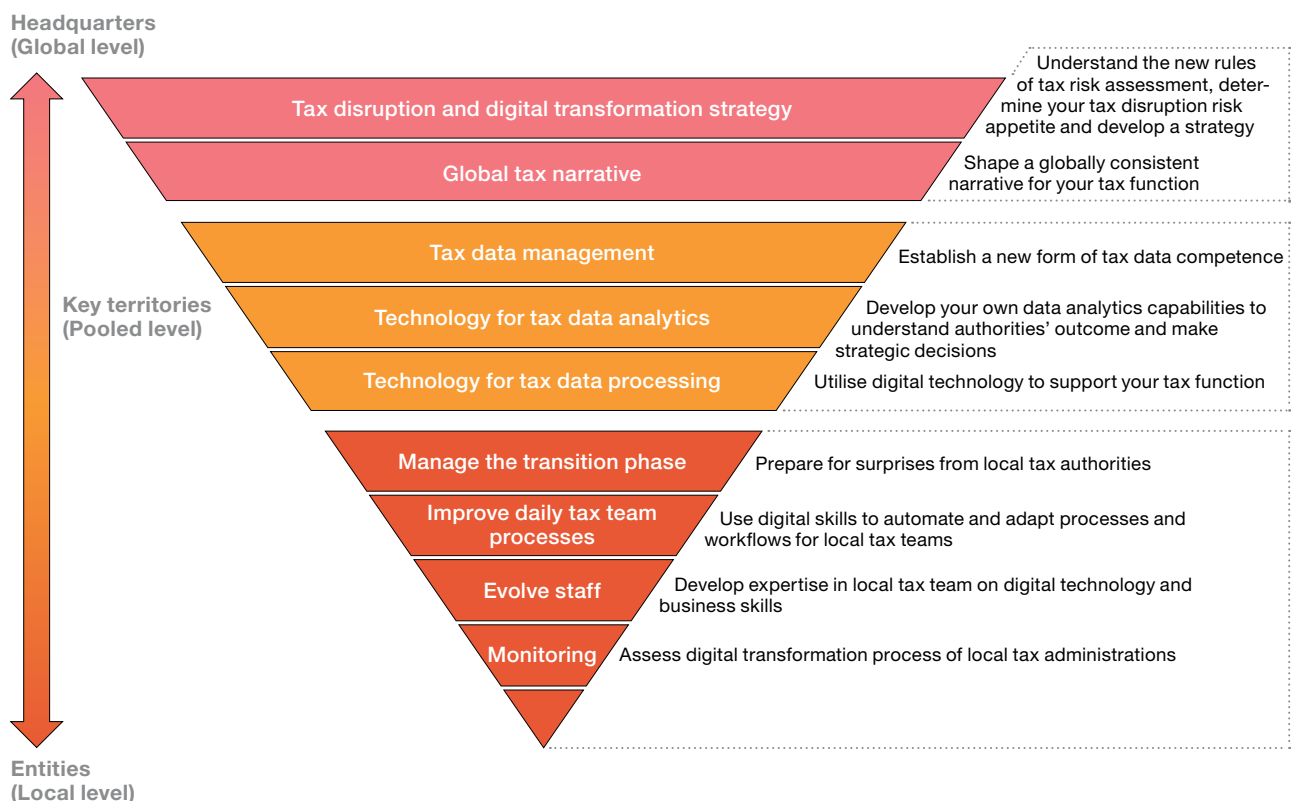
- First, on global level (headquarters), you will find leading tasks that initiate, organise and coordinate the digital transformation of the tax function enterprise-wide. It's about formulating a tax disruption and tax technology strategy for the entire tax function based on a solid assessment and a defined risk appetite, as well as developing a global, coherent tax narrative.
- Second, on the pooled level (key territories), there are technology tasks that cover tax data management, technology for tax data analytics, and technology for tax data processing.
- Third, on local level (entities), we have merged local tasks that involve managing the transition phase, improve daily tax team processes, and evolve staff qualifications. Our pyramid is inverted, because it starts with the sharp end of narrow local measures reflecting the local and area-driven nature of our recommended risk assessment approach and expands broadly to global, enterprise-wide aligned measures.

Utilising our tax disruption inverted pyramid should bring you the following four benefits:

1. Thoroughly planning and organising with such a framework will help you paint a coherent, tax-related picture of your company and **avoid the costs of incoherence** that could arise in the new, transparent world of tax.
2. The tax disruption inverted pyramid will help you **maintain planning security** in a rapidly changing tax environment and give you better fiscal insights into your company.
3. It will also help you marry the internal needs of the tax function with the external demands of tax administrations (to meet new requirements and mitigate risks at the same time as updating the tax function). This will enable you to **avoid double spending and harness synergies instead**.
4. By using the inverted pyramid you should be able to see where you still can **optimise your company's tax position** and exploit the room for manoeuvre left, even in a digital tax environment.

In other words, the *tax disruption management framework* should put you in a position where you know the future path and are confident and well prepared for the journey.

Equipped with a specific roadmap and a solid weather forecast, you should be able to face the climate change that awaits us further down the road.



2. The tax disruption risk framework (the ‘cube’): How to monitor the risk and identify areas for taking action

The *tax disruption risk framework* can be visualised as a cube. It’s designed to keep track of changes, i.e. monitor (and report) external developments, as well as helping you control internal progress made in digitalising your tax function. By doing so, the cube will identify and display the novel risks related to tax disruption. This should help you to strategically identify areas for action and plan for different future scenarios.

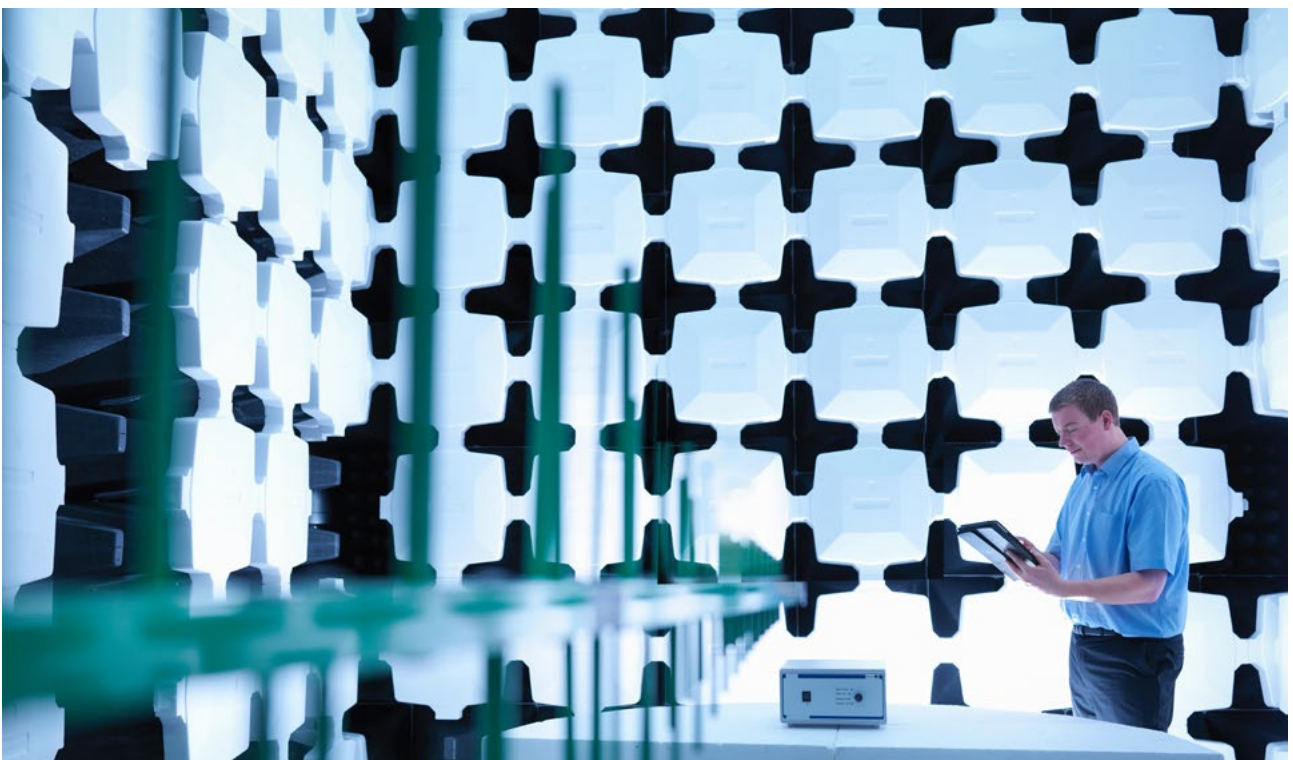
a. The challenge (preliminary remarks)

Developing a structured and consistent framework in this field is particularly difficult for three reasons. Firstly, the tax disruption risk framework has to factor in future developments. So it’s subject to some degree of uncertainty. Managing uncertainty and making strategic decisions about the future is always about making judgement calls, and the quality of the decisions will depend largely on the quality of these judgement calls. This is inevitable, but supporting the judgement calls with a rational and robust approach helps a great deal. Secondly, and even worse, the topic is very complex. The adoption of digital technologies and innovations is not a consistent and linear development. Tax authorities around the world are progressing at different speeds, to different extents and with a different focus (often these differences are also present even within one

administration). We have known for some time now what standardisation means in the realm of tax and, unfortunately, digitalisation is no exception. Every tax authority wants digital data in its own format or language; even the standard audit file for tax (SAF-T) in Spain is not the same as the corresponding file in Hungary. This incoherence across authorities makes it especially difficult to keep track and maintain a clear overview. Thirdly, tax disruption risk is dynamic, and belongs more to the realm of non-quantifiable risk. As such, it is hard to model per se.

That’s why we’ve put a lot of effort in our framework into trying to reduce complexity and minimise uncertainty. We have boiled it all down to a scheme that is easy to handle and maintain, but which at the same time ensures consistency and completeness.

Once the analysis has been completed for your organisation, we hope that the cube will provide your tax professionals with a direction of where to invest and what capabilities to build up (addressing the resource allocation question faced by many internal tax functions). We also hope it will facilitate a conversation at executive and board level, representing risk in a very visual way to help others outside the profession grapple with the complexity of tax disruption, and to help tax professionals articulate their case for change.



b. The framework in a nutshell

In essence, the framework is easy. The first part of the model involves anticipating the (external) tax technology progress of the authorities. What do they plan to roll out and where will they be in, for example, three years' time? What kind of data will they be collecting then? What kind of algorithms and analytics capabilities will they have? The second part of the model includes surveying your own (internal) development path in terms of technology capabilities. What kinds of technology do you intend to implement, and in what areas of activity? How do you plan to automate the tasks of your tax function? Where might a (workflow) problem arise that you could solve with automation?

After you've completed this task the cube will then do its 'magic'. It will quantify and compare the answers to the questions of the two (external and internal) parts of the assessment. In doing so, the cube identifies and visualises tax disruption risk by turning areas of the cube dark red, light red, orange or grey.

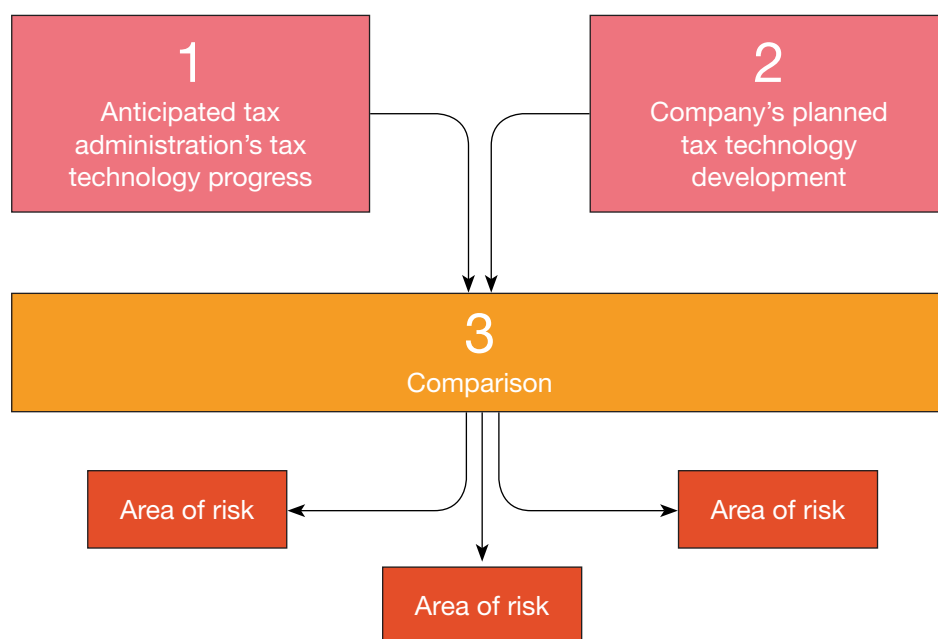
In another step, you can play around with the cube and model different future scenarios. For example, you can analyse what impact it will have on digitally enhancing authorities if you strive for a different development path, and how it will mitigate the risks (or not). In this way, the framework helps you set priorities and systematically identify areas and time for action. For example, if the results of the comparison show that the tax authorities will be one step ahead in a particular field, you should plan to digitally progress in the same field quickly to mitigate risks. If they will be two steps ahead soon, the need to drive change is even greater.

But, as so often, the devil is in the detail, and this makes it a little more complicated.

An overall assessment of one company or one specific tax authority would provide little meaningful insight. For example, it's important to distinguish between different tax types; compliance in the field of indirect taxes requires different skills than in the field of corporate taxes. Customs duties have a different development profile than excise duties.

Furthermore, we had to define different areas of activity. A tax administration's ability to collect taxpayer data does not give any information about how it selects targets for audit and closer scrutiny. For example, the newly collected data can be fed into an algorithm to improve the audit selection process, or only to provide pre-filled tax returns, or both. This varies from authority to authority, and the consequences for companies are quite different. In addition, we must keep in mind that most large companies are engaged in many different jurisdictions/countries. Each point adds another dimension to the assessment.

This means that in the first part of the assessment, where companies assess the progress of the authorities to better understand the prospective requirements and developments, the framework has to distinguish between different tax types, different areas of activity and different countries. This means that each area of activity for a specific tax type and country will be assigned to one of our predefined stages with the help of various hallmarks and questions, which we provide in our online tool. For example, the ability of the tax administration in Brazil in terms of audit selection with respect to corporate taxes might correspond with stage 2, whereas its abilities in terms of collecting taxpayer data in the same area might already match stage 3.



In the second part, where companies assess their own development plan to meet the challenges posed by the authorities, it will also be important for them to determine the stage of their own capabilities for different areas of activity and tax types. For example, company A's ability to understand and collect the data it produces in a digital format with respect to corporate taxes might already match stage 2, whereas its digital risk management analytics capabilities are still only at stage 1. We provide online hallmarks, questions and a digital check sheet to support this assessment as well.

We have ensured that the areas and stages for both companies and authorities are easily comparable. The result of the comparison will reveal a company's ability to meet the upcoming challenges posed by the authorities, what issues should be addressed and how urgent action should be taken – not in general, but in very tangible terms, by highlighting specific areas of activity for a specific tax type in a certain country. Beyond that, the assessment is designed to monitor progress and risk developments over time. That is why we recommend repeating the assessment annually.

Even though this might sound complicated at first, it isn't – because the cube does much of the work. It will become clearer after we've walked you through things in more depth.

c. Areas of tax disruption activity

The impact of tax disruption will be all-embracing and felt in the whole tax environment. To be able to deal with the upcoming risks in a meaningful way, we sought to narrow down the problem. We identified five distinct areas where tax disruption risk can manifest. Each of these five areas represents one field of activities that tax administrations

are involved in. Simultaneously, the five areas describe the spheres where tax professionals have to engage and interact with tax administrations.

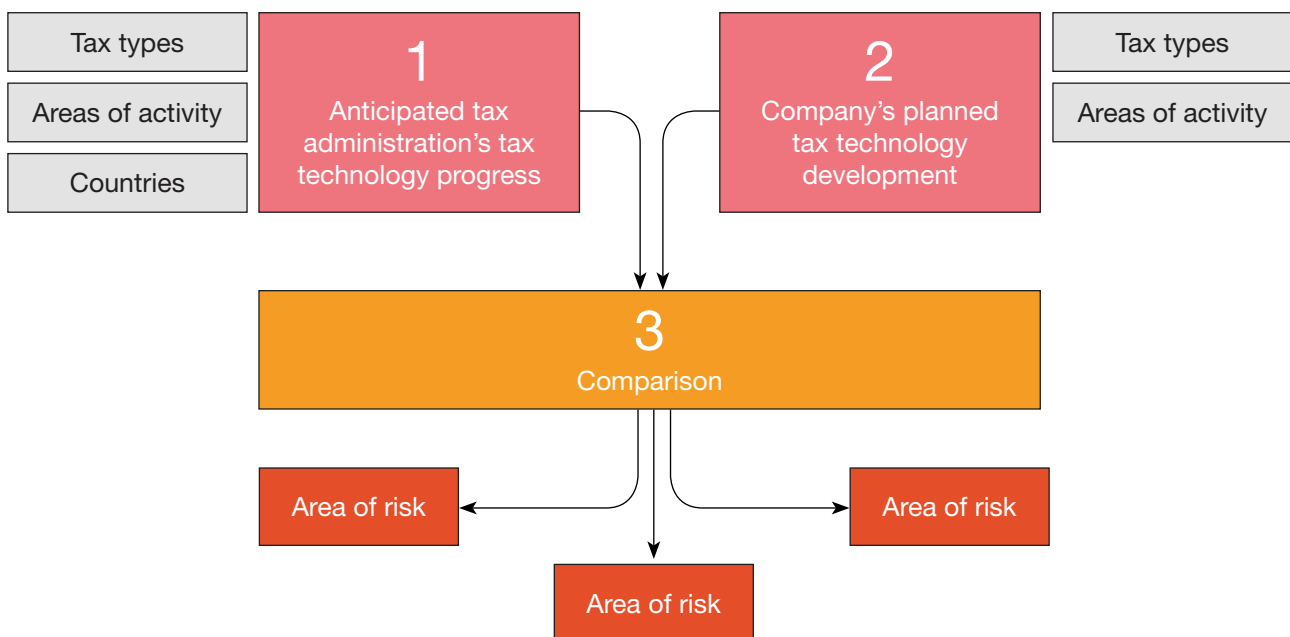
Companies can address each of the five areas to plan progress and mitigate the risk separately. This will help corporate taxpayers to make systematic decisions on where they want to act and invest – and where they want to do less (or nothing) and accept the risk.

1. Access to taxpayer data (tax authorities) ↔ Collecting own data (companies)

The first and most important area focuses on the methods the authorities deploy to gather information and what sources they use. Here it is of interest what kind of data they collect, how they process the data and who they share the data with.

This is important for business, because the authorities base their decisions on this information. In the new digital era, we will see very significant change in this area. Businesses will lose control over the information flow step by step.

The corresponding area on the company side is its own ability to understand and collect the data it produces. What we're talking about is collecting financial and other structured data (e.g. from ERP systems), IoT or Industry 4.0 data, as well as qualitative business information, often currently sourced from emails and discussions with the business.



2. Tax return preparation (tax authorities)
↔ Tax return preparation (companies)

The second sphere concentrates on who is responsible for preparing the tax returns for a specific tax type. Are companies still undertaking this task, or are tax administrations taking over – perhaps only partially in the beginning (e.g. with pre-filled tax returns), and then more and more?

This is another layer where companies will lose control and will therefore need to react. As long as the company does the tax return, it remains in control, at least to some degree, of the information it provides.

On the business side, this area addresses the question of who is in charge of the tax return. How is the workload shared? Are tax returns filed manually, are some processes automated (e.g. with robotics or other advanced analytical techniques)?

3. Audit selection (tax authorities)
↔ Risk management analytics (companies)

The area of audit selection involves the way the taxman evaluates and prioritises risk; that is, how he decides who to scrutinise more closely and where to conduct an audit. What factors or behaviour patterns factor into the authority's decision to demand further, more detailed explanations and information? How does the taxman identify 'outliers' in the data?

Once advanced analytic algorithms, and thus pattern recognition and anomaly detection, play a more central role in the administration's assessment, it becomes crucial to avoid 'sticking out' and becoming the target of closer examination.

In our view, the area of audit selection is going to play a major role in the near future, but will lose importance over time once the tax authorities have established the ability to monitor all significant companies all the time (real-time auditing based on very large datasets).

Associated with audit selection is companies' ability to respond by developing their own risk management analytics capabilities.

4. Audit process (tax authorities)
↔ Reporting (companies)

The way tax administrations conduct audits is vital as well. During a tax audit, the authorities usually scrutinise a company's tax affairs a lot more closely than under their general tax compliance risk schemes. In this area we also will see significant progress. The choice of information and processes that authorities put emphasis on will make a huge difference. What kind and amount of data is relevant to the audit? What data might be collected in addition?

This sets limits on your ability to react. What range of explanations will you be allowed to offer, and in what way will you be able to adapt the tax narrative retrospectively?

Linked to this is businesses' reporting capability. Is the work done ad hoc in firefighting mode, or is it embedded in a strategic scheme? To what degree has tax function oversight about data been shared with external parties? How is coordination with tax functions structured in other jurisdictions? These questions matter here.

5. Sanctions/damages (tax authorities)
↔ Response to tax authority sanctions (companies)

The sphere of sanctions and damages focuses more on particular consequences of taking risk – thus posing another layer of potential uncertainty.

With new digital capabilities and new requirements, the authorities will alter their threats as well. What do you have to prepare for in a worst-case scenario? What exactly is penalised? Which and what kind of penalties and damages do you want to avoid?

This relates to the area of how a company is able to understand and tackle the authority's decision to impose penalties. Is the company able to argue in a convincing way and present valid arguments that are accepted in the new digital world of tax?

For an overview see:



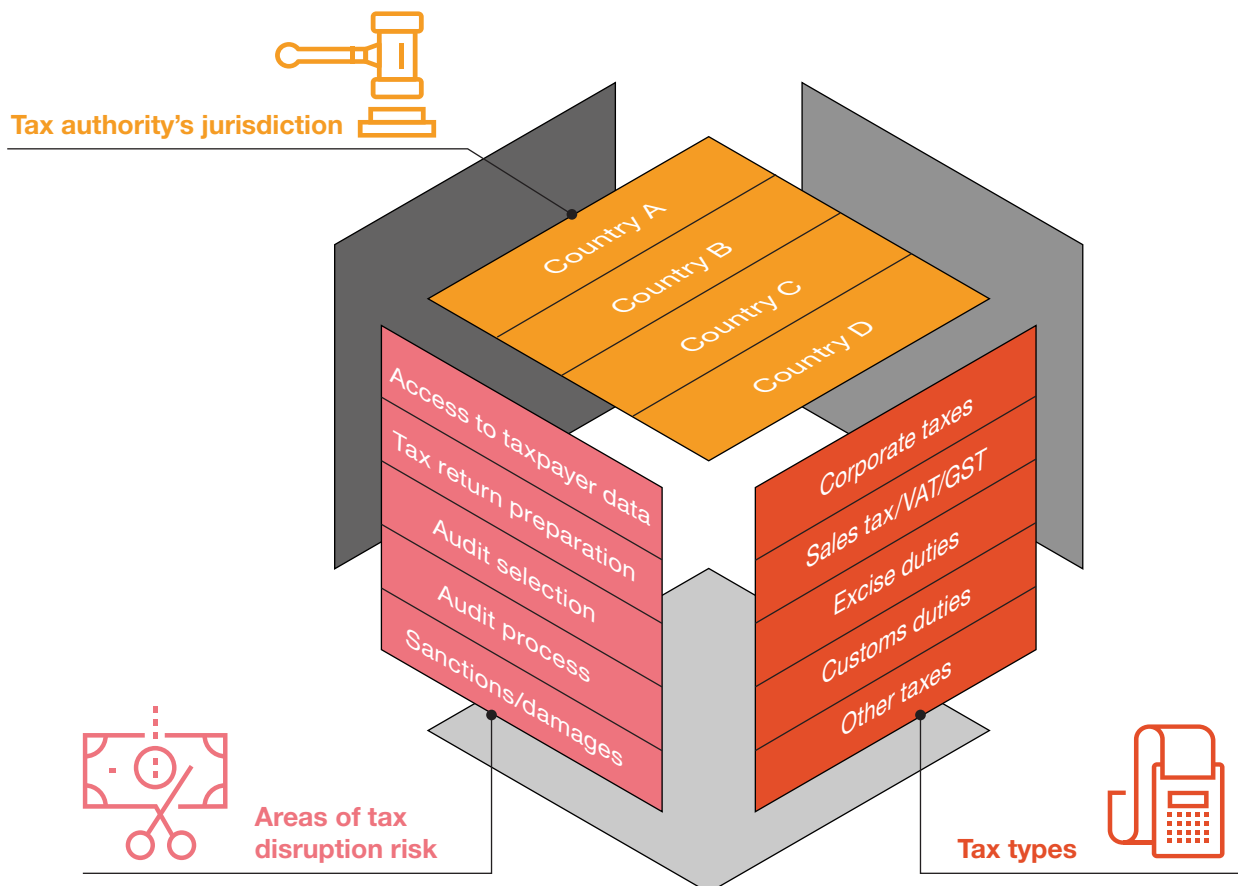
d. The tax disruption cube

The framework we developed to assess tax disruption risk uses as a starting point the 'Risk Management Control Framework for Tax' from Elgood et al.¹², which in turn is based on the most widely recognised international standard for an integrated framework of internal control (known as the COSO Framework). However, we had to make significant modifications to be able to adjust it for the new field of tax disruption.

As mentioned above, the five areas of tax disruption activity demonstrate different characteristics for each tax type. Tax administrations collect completely different data with

different skills for indirect tax purposes than for corporate income tax. The department responsible for sales tax will conduct audits in a different manner and with different proficiency than the department responsible for sales tax/VAT/GST. In addition, the situation differs in each country or jurisdiction as well. The departments of the tax authority in Switzerland are progressing at a very different rate than those in Brazil. HMRC in the UK is focusing on different aspects from the IRS in the USA.

In the light of these additional dimensions, we decided to visualise the assessment of the tax authorities as a three-dimensional cube – the tax disruption cube – that can be presented as follows:



¹² T. Elgood, I. Paroissien and L. Quimby, 'Tax Risk Management', PricewaterhouseCoopers.

e. Assessing tax technology progress of tax authorities around the world (step 1)

Before conducting the assessment, corporate taxpayers will have to choose where they want to set priorities. What markets and territories are essential for your company? What tax types (e.g. corporate taxes, sales tax/VAT/GST, customs duties and so on) are of interest? The assessment can include all countries where your company does business, or just some key markets. It can comprise just one or two tax types which are particularly relevant for your business, or all tax types you have to deal with.

The goal of this assessment is to determine the authority's future tax technology capabilities and come to a view on likely development. The time horizon is variable. You can aim to assess the technological state and capabilities of the tax administrations in three, four or five years' time, for example. This is up to you. We recommend a time horizon of three years. During the assessment, you will assign each area of activity for a specific tax type and country to one of our predefined stages as outlined in detail in Appendix 1, and with the help of the hallmarks below:

Assessment hallmarks

Tax Authorities

	Access to taxpayer data	Tax return preparation	Audit selection	Audit process	Sanctions/damage
Stage One	Tax return and other disclosures	Taxpayer	Risk assessment and prioritising mainly manually by tax inspectors, sometimes rule-based algorithm	Manual sample testing of data by inspectors (often on site)	Tax due + penalties for wrong tax return Reputation
Stage Two	Disclosures and wide-ranging mandatory reporting obligations	Taxpayer	Risk assessment by machine learning algorithm, prioritising by inspectors focusing on outliers	Sample testing by algorithm, manual sample testing by inspectors (often on site)	As above, adding personal liability
Stage Three	Vast own data collection capabilities independent from taxpayer	Taxpayer	Risk assessment, prioritising and selection by algorithm, supervised by inspectors, real-time auditing of every-one for some tax types like e.g. VAT (no selection anymore)	Extended sample testing by algorithm, sample testing by algorithm with directly extracted data (remote or on site), rare, selected manual testing by inspectors on site	As above, including extended personal liability, and risk of data loss/mismanagement by the authorities (including hacking of authorities' database)
Stage Four	Extensive information exchange: Including data from other tax types, other jurisdictions (automated) 'Network analytics effects'	Taxpayer	Risk assessment, prioritising and selection by algorithm, only partially controlled by tax inspectors; real-time tax auditing by algorithm for more tax types	Testing based on huge cross-function data collections by algorithm ('automated auditing'), mainly remote, rarely on site (fraud)	As above, adding risk of inappropriate data quality, unproven data integrity
Stage Five	Access to all data required to determine tax (direct data extraction; fully integrated platforms)	Authorities (automated taxation)	No selection necessary anymore, real-time tax auditing by algorithm with more information for all taxpayers and all tax types	Shift towards IT and process audit	As above, adding risk of inappropriate internal tax processes and risk of hacking of direct data flows to authorities
Stage Six	Including data from other public sector departments	Authorities (automated taxation, automated payment?)	Real-time auditing by algorithm with more information	IT and process audit	As above

□ Traditional methods □ Disruptive methods

For instance, let's say your headquarters are located in Canada. You'll want to know what's going on there in the field of corporate taxes. So you'll have to determine what capabilities you think the Canada Revenue Agency will have in three years. Accordingly, you will ascertain the appropriate stage for each area of activity, i.e. 'access to taxpayer data',

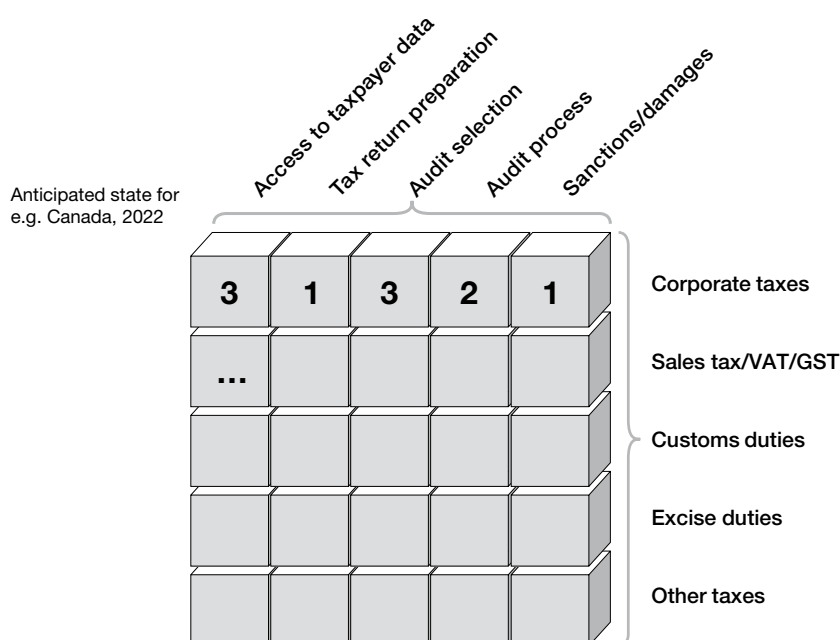
'tax return preparation', 'audit selection', 'audit process' and 'sanctions/damages'. Don't worry: we have drafted a list of sample questions designed to help you deduce the stages in an online questionnaire available on our homepage.¹³ For example, in the area of 'access to taxpayer data' you should be able to answer questions like:

- What kind of information will the tax authority collect about the taxpayer in three years' time?
- What kind of information will the regulation oblige you to disclose?
- What amount of information will it gather?
- What will be the source of the information? Will the authorities collect publicly available information? Will they collect information from third parties?
- Will the authority exchange information between its different departments?
- Will it exchange information with other countries' authorities?
- Is the information exchange going to be automated?
- Will the authorities be able to extract data directly from your company?
- Will you be obliged to copy B2B data directly to the authorities?
- Are the tax authorities going to collect information from other public sector departments?

We are aware that sometimes it might be challenging to answer the questions and determine a stage. But it's not as difficult as you might think at first. On the one hand, there are many indications of future developments. In some countries, the government or tax administration are announcing their plans directly. In other countries, you will find the relevant information in the budget. Usually, technological progress has to be accompanied by legislative change, which gives you further clear hints. On the other hand, you know that technological change is exponentially accelerating, and you know the abilities of the private sector. This allows you to estimate the steps in development better. Another potential option is to base the assessment on assumptions made by tax experts within your organisation

who interact with the authorities on a daily basis, or to use our 'tax disruption radar', where we summarise and visualise our own insights.¹⁴ We admit that there are specific skills that might be more opaque, such as the precise functioning of a specific algorithm. Nevertheless, making these kinds of judgement calls consciously within a consistent framework is a lot better than complete uncertainty.

As a result of the first part of the assessment, you will get an overview containing figures (the stages) quantifying your estimation of the future tax technology capabilities of the tax administration for each area of tax disruption activity and each tax type. The result could be modelled as follows:



¹³ <https://www.pwc.com/taxdisruption>

¹⁴ <https://www.pwc.com/taxdisruption>

f. Assessing the development plan of a company's technology capabilities (step 2)

In the next step, you will have to assess the planned tax technology capabilities of your own company in a similar manner as you assessed the capabilities of the tax authorities. You will assign each of your areas of activity for a specific tax type and country to one of our predefined stages as outlined in detail in Appendix 2, and with the help of the specific hallmarks below. The stages of progress and hallmarks for companies are defined in such a way that they mirror the stages for the tax authorities and allow a direct comparison. A company will be in a position to mitigate and control change only if it's reached at least the same stage as the authorities.

The stages are not completely fixed. They are interconnected, sometimes they overlap, and sometimes they intertwine. The goal is not to be completely accurate, but to provide companies with orientation on where they stand in relation to the authorities. You may have realised that there are only five stages for taxpayers compared with six stages for the authorities. This reflects our view that at the end game, corporate taxpayers will not be able to access the same level of information as the authorities. At the time of writing, our experience is that most companies are currently between stage 1 and stage 2.

Assessment hallmarks

Companies

	Collecting financial data and other structured data	Collecting qualitative business information	Tax return preparation (technical; document assembly)	Risk management analytics	Reporting (strategic; tax plan and coordination)	Response to tax authority audit/assessment
Stage One	Manual selection and extraction of data from ERP Significant post-processing required	Data gathered via interviews and emails.	Manual	Limited analytics possible as data is not available in a structured way: Manual tax risk management	Reporting done on an ad hoc basis for each jurisdiction individually; limited oversight of all data leaving a company and being shared with authorities	Manual by tax experts
Stage Two	Automated extraction and storage of all tax-relevant and previously structured data	Data gathered by structured questionnaire (with help of e.g. RPA)	Some processes automated (e.g. RPA)	Basic 'descriptive' analytics available to tax department to support tax analysis; tax disruption risk management in place	Tax function has good oversight of all data being shared with external parties. Beginning to align tax narrative over tax types	Manual by tax experts with more information
Stage Three	Tracking and monitoring of tax-relevant data and data flows including third-party data	More tax-relevant business data is digitalised and structured (with help of e.g. NLP)	More processes automated (e.g. NLP)	Advanced analytics using some machine learning elements	Coordinated with other jurisdictions (globally consistent tax narrative developed)	Able to respond at same data-driven level
Stage Four	Global, centralised tax-relevant data pool	Automated extraction and storage of all tax-relevant business data in same global tax-relevant data pool	Automated to large extent	As above with more information	Tax strategy and planning heavily supported by algorithmic systems, mainly controlled ex-post by central tax unit	As above, but with comparison to authorities' decisions in other jurisdictions
Stage Five	Monitoring data extraction flow to authorities, only creation of data still controllable	Monitoring data extraction flow to authorities, only creation of data still controllable	By authorities, only possible to control authorities' outcome	Automated tax-mitigating capabilities, which are able to intervene (partially) autonomously in real-time, if necessary	Algorithmic tax planning, risk mitigation and strategy with new focus on own IT systems, data flows and processes	Comprehensive, predictive own modelling capabilities to predict test authorities' outcome and defend own view

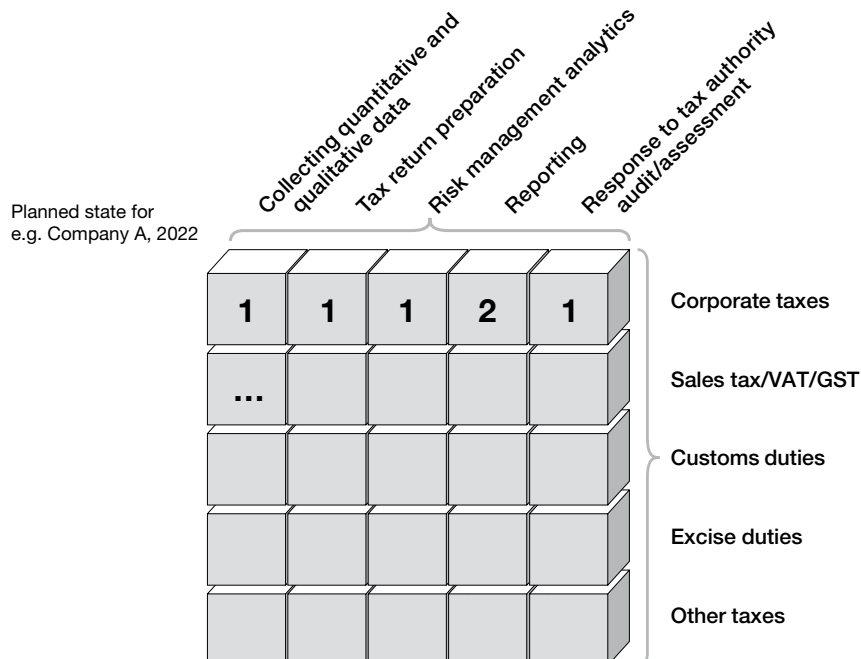
To support you in your assessment, we have also collected a list of relevant questions in an online questionnaire, again with more details on our homepage.¹⁵ It's all about thinking how the authorities' technology (as evaluated before) will affect your tax function and assessing yourself in terms of how you will deploy technology to respond. For example, in the area of 'risk management analytics' you should collect answers to questions like:

- How will you analyse the risk and likelihood of being audited in three years' time?
- Is your tax team going to be supported by analytics software?
- What kind of analytics do you plan to use? Will it be mainly descriptive? Will it be advanced, using machine learning?
- Do you intend to have predictive capabilities?
- Will you implement a tax disruption risk management approach?
- Are you going to promote a coordinated and uniform strategy to tax disruption risk management in your company?
- What kind and what amount of data do you plan to feed into your risk management model?
- Will the (digital) tax perspective be integrated in all business processes and systems automatically?

As the output of the second part of the assessment you will have the familiar model, this time containing figures quantifying your company's planned tax technology capabilities for each area of tax disruption activity and each tax type.

If required, it would be possible to add another dimension differentiating companies' planned abilities by different subsidiaries in different countries.

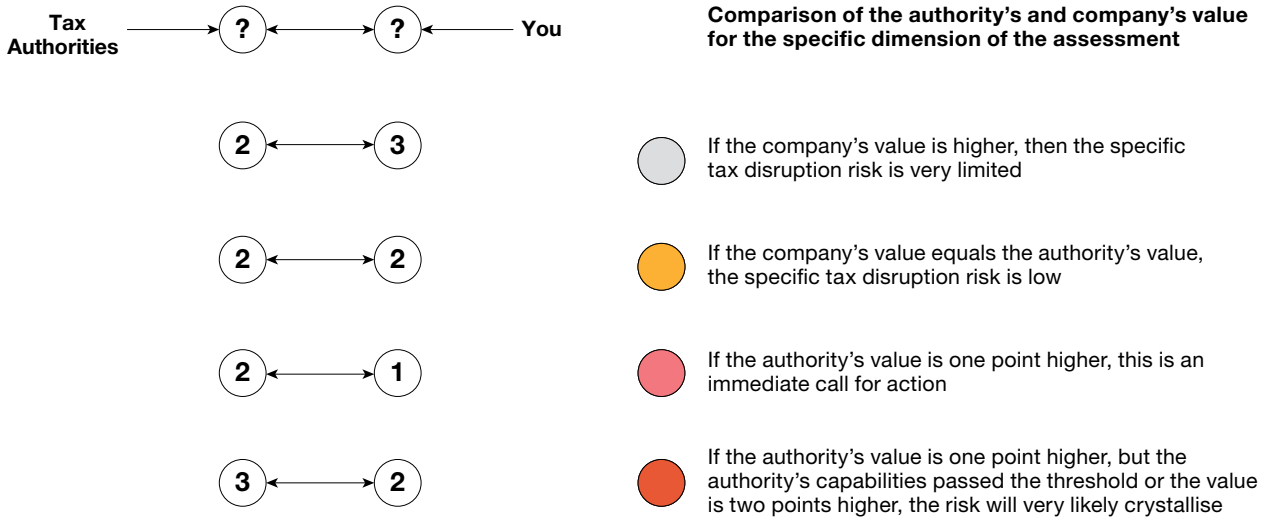
We have refrained from doing so, because we assume that companies want to scale technology capabilities within the organisation rapidly, leaving little material difference from entity to entity over time. Adding another dimension would only complicate things without adding real value to the assessment. Nevertheless, this might be an option for enterprises scaling slowly that want to monitor the risk during transition phases or for organisations with decentralised tax operating model planning on the basis of very diverse technology capabilities.



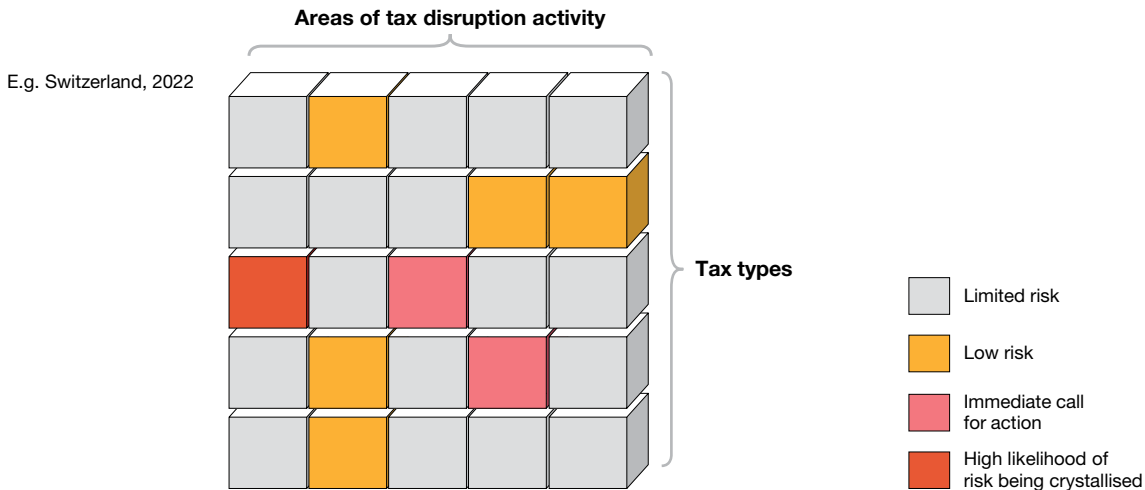
¹⁵ <https://www.pwc.com/taxdisruption>

g. Identifying areas for action (step 3)

In step 3, the cube automatically compares the outcomes of the assessment in steps 1 and 2 in the following manner.¹⁶ The result will reveal upcoming tax disruption risk in four colours.



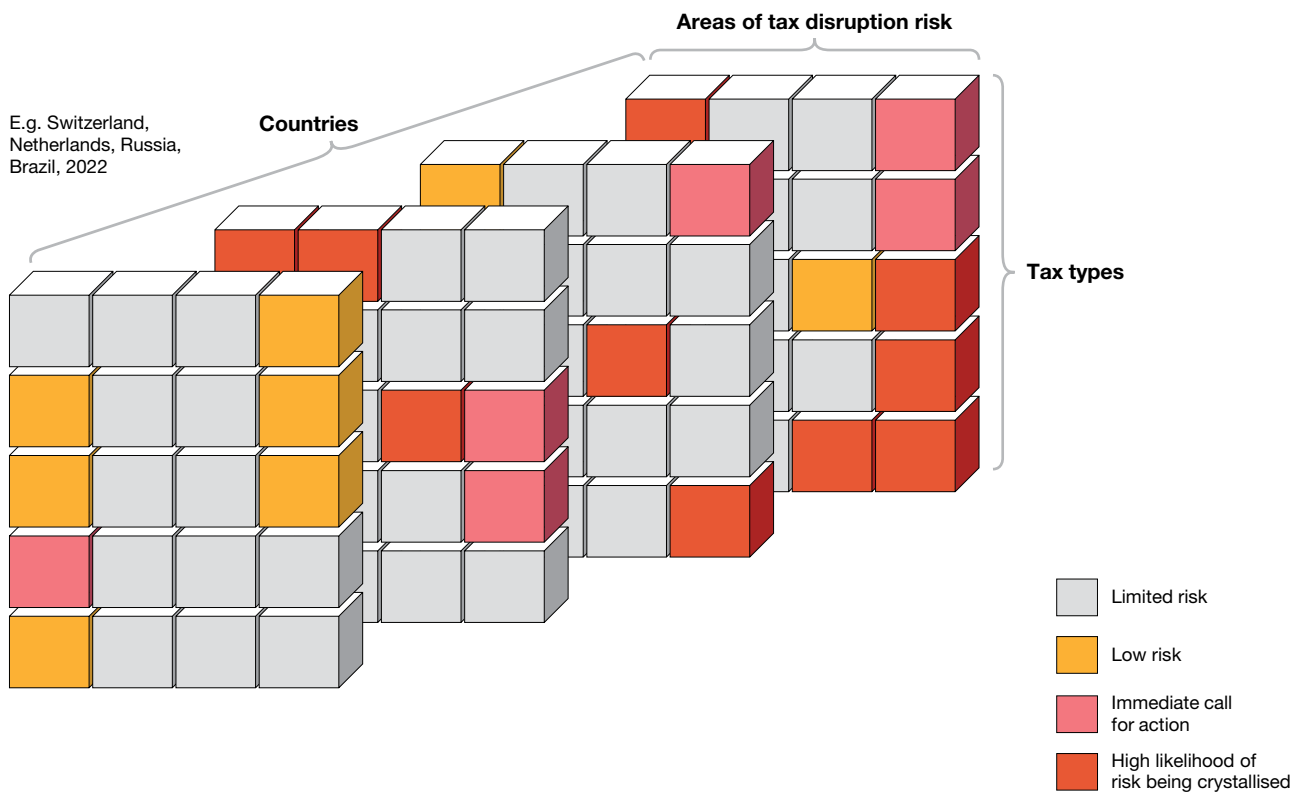
The model will still be two-dimensional, with the two dimensions 'areas of activity' and 'tax types' coloured to indicate future risk (but so far only for one country):



¹⁶ As explained above, we have designed the output to make sure that direct, meaningful comparison is possible.

h. The tax disruption cube in action

At this point we have all the ingredients to breathe life into our tax disruption cube. As soon as you perform assessments of more tax administrations around the world and add the results – ultimately the assessment is developed for multinational corporations – the cube is formed:



On our homepage¹⁷ you can see an interactive example of how the tax disruption cube visualises the imminent high-risk areas – company-wide and at a glance. It is designed as an easy-to-use tool to help you understand and monitor the complicated development of tax technology around the world, and to help you evaluate the risk and quickly identify areas for action.

Firstly, the tax disruption cube helps companies deal with the prioritisation problem: the challenge of distributing their limited resources to areas where action is truly needed. Secondly, the tax disruption cube also helps companies with the timing problem. As we explained in depth in Part 2, it's hard to judge the perfect moment to invest. The cube helps show the areas where action is more urgent. Thirdly, the cube can be used as a scenario planner to estimate the outcome of different approaches. You can feed it with deviating information on how you plan to progress and estimate the consequences in relation to the authorities and risk.

Beyond that, the whole assessment is designed to monitor progress and developments over time. We think that it should be repeated at least on an annual basis, because the new, digital tax environment is changing constantly. In terms of the cube it means that the colours are changing constantly as well – which as you'll see online, can be visualised very pleasantly with graphic animation.¹⁸ Areas that are grey (low risk) for 2022 might become light red (immediate call for action) for 2023 because a tax administration announced it would be rolling out some innovative technology. Other areas that are now red might turn green because the company has initiated measures to deal with the issue.

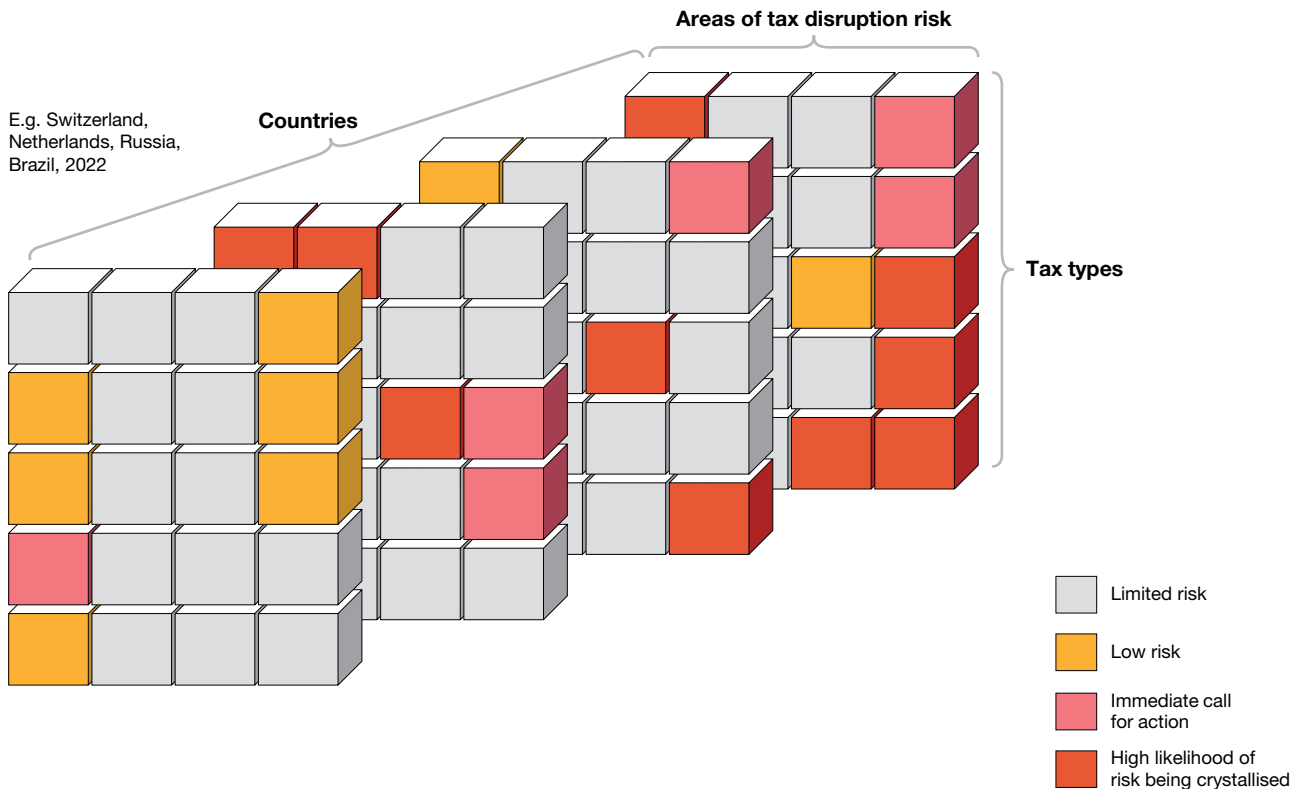
The tax disruption cube can also be used slightly differently. It's possible to focus on one key country, for example, and directly display the changes over time, sidelining other jurisdictions. This specification for the cube might be useful if you only want to scrutinise the anticipated change more closely in one key country rather than throughout the whole enterprise.

¹⁷ <https://www.pwc.com/taxdisruption>

¹⁸ <https://www.pwc.com/taxdisruption>

In our comprehensive approach to tax disruption management, we have developed the tax disruption cube as an initial measure that helps your company get an overview of progress and development anticipated externally and planned internally. The core objective is to identify potential risk and take action accordingly, i.e. to be able to align the necessary digital measures to mitigate risk with digital advances targeted for other reasons like improving workflows. In other words, it helps you understand and grasp the upcoming challenges of the new world of tax.

However, the cube doesn't say anything about the specific actions that should be taken and how you should manage this change. This will be the task of our tax disruption pyramid, which we will introduce in the following section.



3. The tax disruption management framework (the ‘inverted pyramid’): How to develop a strategy and tackle digital transformation

In the previous section of this guide, we introduced our first framework, the *tax disruption risk framework* (the cube). Now it's time to put some flesh on the bones. The *tax disruption management framework* is a structured approach designed to help you deliver the digital transformation of your tax function to cope with tax disruption.

The *tax disruption management framework* can be visualised as an inverted pyramid. It's designed to provide a systematic and company-wide approach to the digital transformation of your tax function, giving you an idea of the measures that should be taken at each level of the organisation to mitigate the novel risks and, at the same time, reap the benefits of a technology- and data-enabled tax function. The inverted pyramid thus gives you a blueprint enabling you to develop a consistent tax disruption and tax technology strategy and carefully plan your next steps.

Introduction

The framework in a nutshell

As with every management framework, the *tax disruption management framework* should help an organisational unit reach new levels of performance by channelling the company's general (tax-related) objectives into a comprehensive set of clear and measurable steps. In our view, a systematic approach to digitally transforming the tax function must tackle the upcoming challenges at different levels of the organisation. A mixture of measures at global headquarters level, overlapping key territory level and local entity level is therefore necessary.

The first category of measures, those at global headquarters level, should apply for all tax teams in the same way. They have to be aligned globally in a centralised manner. The third category of measures, local measures at entity level, can be different for each local (national) tax team, reflecting the specific requirements at this level. The second category of measures, the overlapping ‘key territories’ measures, are in between. It's often useful to apply these measures neither directly at global level nor solely at local level, but instead by pooling some jurisdictions together depending on the specific characteristics of the organisation and its financial steering model (regional, divisional, product, etc.).

Consequently, we have merged ‘leading tasks’ at global level. The board, executives and head of tax should become aware of the changing rules as we move to a digital tax environment. They have to initiate, organise and coordinate measures on a coherent, enterprise-wide basis to tackle this upcoming change. At this level it's important to determine

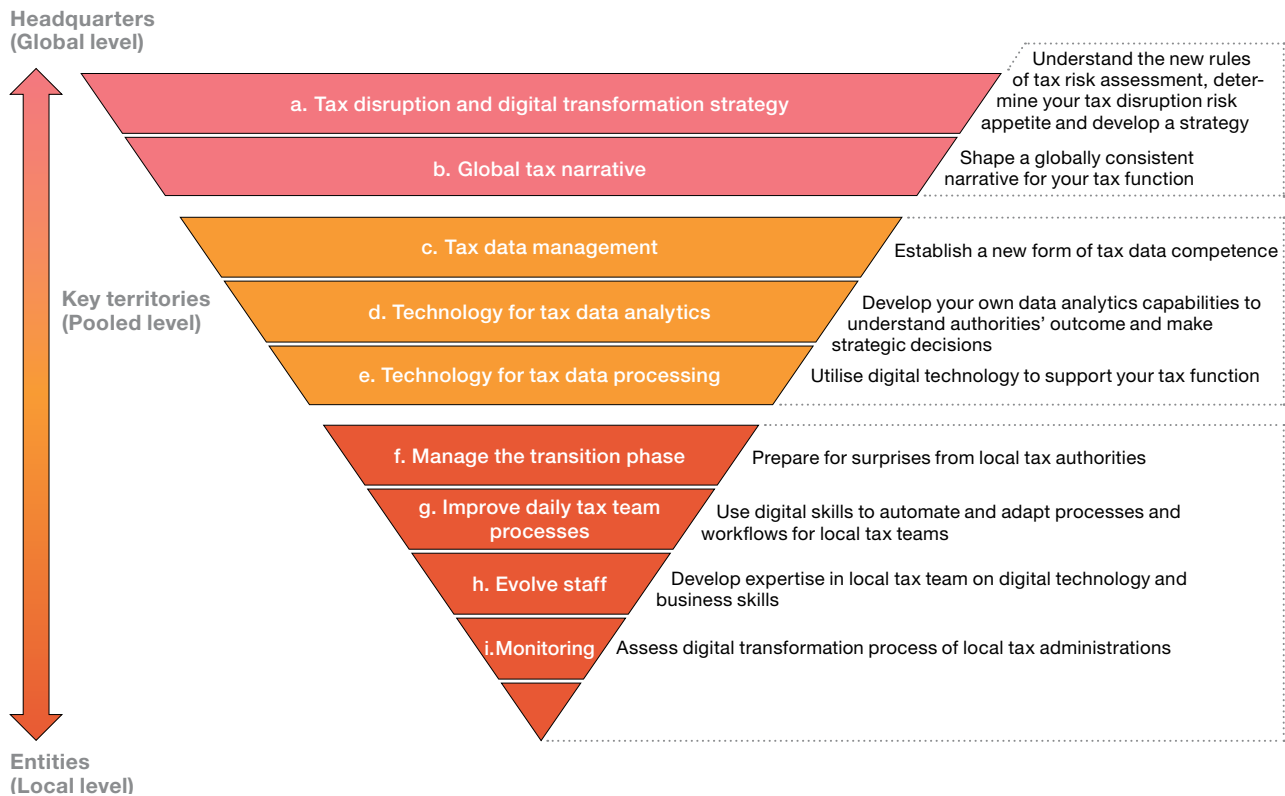
the company's level of risk appetite, map out a tax disruption and tax technology strategy for the entire tax function and develop a global tax narrative.

At the second level we have brought together ‘technology tasks’ that can be applied at both a local and global level depending on the specific needs of the company. But in general, we think it's appropriate for these measures to select certain ‘key’ territories, for example those with the highest risk from a tax perspective, those that are most important from a revenue-generating perspective, or maybe those that are most progressive with the best technology expertise, and pool them together. This is useful, for example, if the technology at stake needs a wide field of application or has to rely on big data sets. Sometimes, significant investments in technology will only yield a profit if they are deployed on a larger scale. Another advantage of pooling some jurisdictions together is that it makes it possible to test and adapt digital innovations and processes, as well as gain experience, before rolling out measures to the whole company. At the same time, it's possible to bundle investment resources and avoid unnecessary effort by developing the same new approach in two different locations. These measures should therefore be aligned over pooled jurisdictions, at least in the beginning; later they can be rolled out across the whole organisation. At this level you will find tasks such as developing and operationalising skills and tools in the areas of tax data management, technology for tax data analytics and technology for tax data processing.

At the third level we have concentrated ‘local tasks’. Change inevitably has to be managed at entity level as well. In every jurisdiction or subsidiary, tax experts have a different style, qualifications and attitude towards progress and varying regulations. We believe it's necessary to drive the change in every area with different measures that respond to the specificities of the local entity. For example, if a local tax team is open to change and skilled in the use of digital tools, it might make sense to train them in extract, transform and load (ETL) tools earlier than others that are less tech-savvy, where perhaps only robotic process automation (RPA) is an appropriate starting point. At this level, tasks like managing the transition phase, improving daily tax team processes and developing staff matter.

The inverted pyramid displays these diverse requirements. Starting from the sharp end, i.e. from local measures reflecting the local and area-driven approach of the risk assessment, it expands to address tasks best undertaken at a joint, overlapping level, and broadens out to meet challenges at a global, enterprise-wide level.

Our tax disruption management framework can thus be visualised as follows:



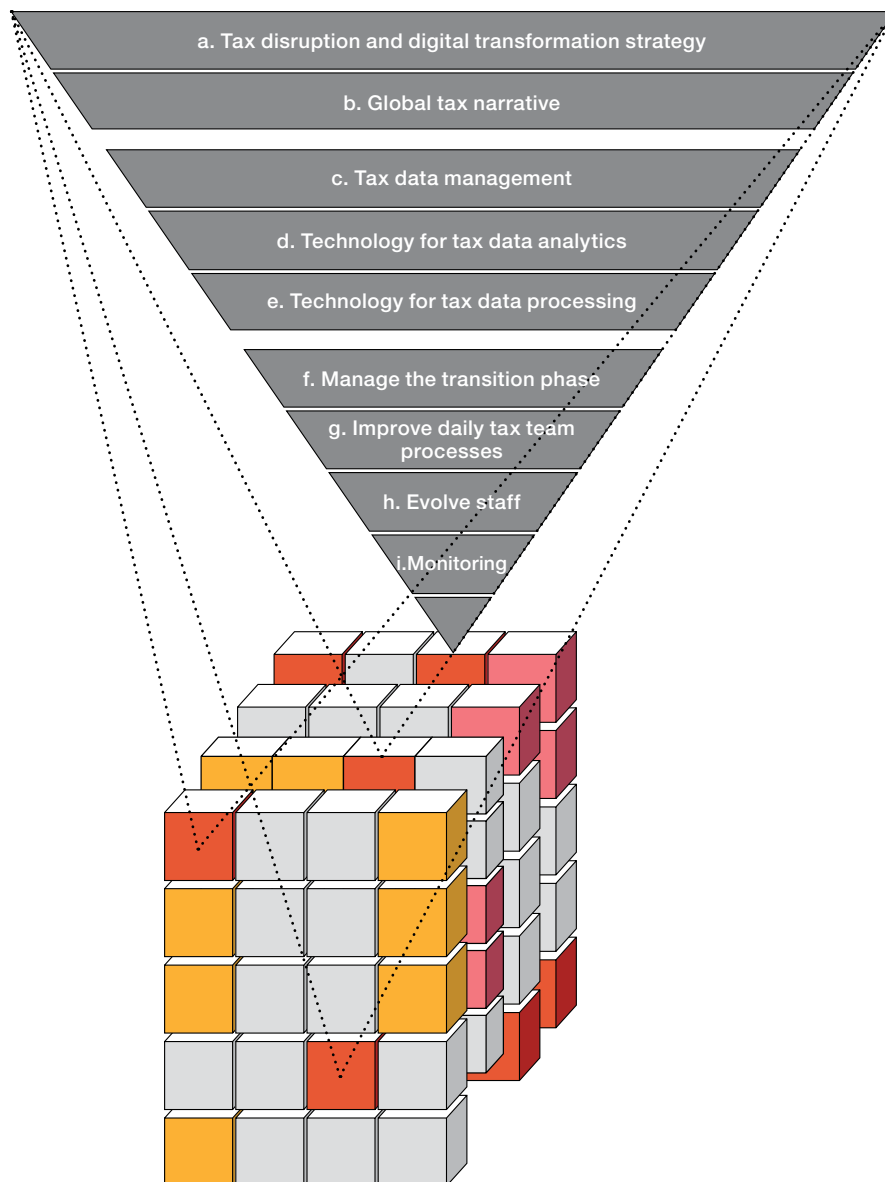
Digital transformation of the tax function is often lumped together with the digital transformation of other back office functions, especially finance. With our visualisation, it should become evident that the tax function is different. The finance function can usually be organised focusing only on the global, organisation-wide level, because, even though there are local specifics (GAAP accounting or similar), many of the process steps are broadly similar. This doesn't apply to the tax function. As we have explained extensively above, tax administrations act very differently and have different legal and technical demands in every jurisdiction. Individually tailored measures are necessary in the form of local tax teams with the specific local expertise. Change efforts therefore always have to take the local perspective into account.

The inverted pyramid and the cube: aligning two developments

As far as we can observe, common approaches to the digital transformation of the tax function focus almost exclusively on the internal perspective of the company. They therefore address topics such as how a tax function should improve digitally, what workflows should be automated, or how processes could be optimised using digital tools only with the goal of improving capabilities and increasing efficiency and/or free capacity to fight a growing number of fires. Don't get us wrong: these are very valuable goals, but we think they represent only one side of the coin.

The common approaches typically forget the external perspective. As described above, tax administrations that have introduced digitalisation pose significant new risks and present many new requirements for companies that have to be addressed at the same time. These days, embarking on a digital transformation journey often means that employees with intrinsic motivation for digital change, or with additional budget to spend, focus on specific problems they want to solve. This local approach on an ad hoc basis naturally lacks a clear and enterprise-wide strategic plan.

A more effective approach might be to focus coordinated internal change efforts on the development of local tax authorities. A tax technology investment strategy must marry the internal needs of the tax function with the external demands of tax administrations, otherwise investment time and effort will be allocated inefficiently. For example, non-specific investments in improving the workflow of a tax function might well free up capacity, but this additional capacity might not be sufficient to answer the growing number of inquiries issued by a local tax administration with digital capabilities. In this example, investment should be focused on ensuring fast and accurate responses to information requests. If you don't align both digital transformation developments, you will almost certainly end up spending more than you need to.



To tackle this issue and bring together both developments in one consistent strategic approach, the inverted pyramid builds on the cube. The cube draws attention to the development of the authorities and the resultant risk for the corporate taxpayer. The pyramid, regarded in isolation, serves as a general guide to the digital transformation of the tax function.

In combination, the two frameworks align both the internal and external trends. Monitoring the progress of the tax

authorities, while systematically investing and reshaping the tax function with tax technology, sets you on the right path to an all-embracing and consistent approach to tax disruption management, and to optimally allocating change efforts and investment resources. This means that when applying the pyramid we should constantly take the results of the *tax disruption risk framework* into account.

The three levels of the pyramid

Headquarters (global level)

At this level you will find measures for initiating, organising and coordinating the digital transformation of the tax function in a coherent manner across the enterprise. These measures will help formulate a tax technology strategy and a global tax narrative based on a solid assessment and a defined risk appetite.

With thorough planning and organisation, you will ensure that you paint a coherent, tax-related picture of your company, avoiding double spending.

a. Tax disruption and digital transformation strategy

So what are the steps that organisations should take to develop a strategy around this change? In our model there are five steps.

Understand the new rules in a digital tax world

A prerequisite of developing a robust tax disruption strategy is for business leaders to be aware of the new rules of the game' and how they differ from the 'old' world. Only then can they appropriately define the revised tax risk appetite and subsequently complete a risk assessment and digital health check to assess where they are and where they need to be.

When we described the future tax environment in Part 1, certain shifts should have become apparent. With the help of digital technologies, tax authorities are able to broaden their scope and gain much more information about a taxpayer than was previously available, addressing an information asymmetry that currently works in favour of the corporate taxpayer. The tax function will therefore gradually lose the

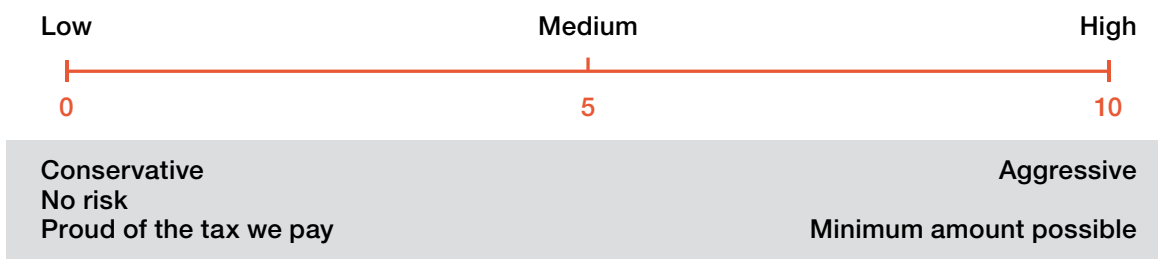
ability to control the information flow. With all this additional information, we *will* see the chances of 'escaping' an audit fall dramatically, tending to zero: we are moving from a world where non-compliance *might* be identified to a world where it will be identified. In addition, the shorter response times and shift towards real-time significantly reduces the period that companies have to react to challenges raised by tax administrations. Topics like the reliability of data will become more important to signal competence and good governance to the authorities and to help build trust.

Meanwhile, new regulation with regard to personal liability for tax-related incidents will spread. Along with the shift towards real-time, business leaders may face the consequences of tax-related decisions a lot more quickly than they're used to. Problems won't surface years after the fact; they will kick in very quickly.

Define a new level of tax risk tolerance

Business leaders also need to decide what level of risk they're willing to accept when it comes to engaging with digital tax authorities. This is generally different for every organisation, and usually the responsibility of the board. Our general view is that risk management isn't necessarily only about minimising risk. After all, businesses make profits by taking risks. A no-risk strategy is probably neither cost-effective nor right for any business. It's always about balancing the value that can be achieved or the costs that can be saved by taking risks or by reducing risks, keeping in mind the resources needed to manage both alternatives.¹⁹

By setting a scale (or a score out of 10) you give yourself a criterion for judging where you are now on the risk scale – and where you would like to be in the future.



¹⁹ For more information about this topic, see T. Elgood, I. Paroissien and L. Quimby, 'Tax Risk Management', PricewaterhouseCoopers.

Do a risk assessment and a digital health check

To understand where you are today with regard to the new risks, it's important to start with a risk assessment. At the same time, you should assess your own digital tax capabilities as a starting point for further planning.

For exactly that purpose, we developed the *tax disruption risk framework* (the cube) introduced earlier in this guide. It has the advantage of providing clarity on both questions. To our mind, the assessment of your own digital tax capabilities should in any case be a substantial part of a solid tax disruption risk assessment.

Relying on the cube, we recommend monitoring the number of area-specific ('small') cubes. The small cubes indicate the risk in a specific area, for a specific tax type in a specific jurisdiction. The overall number of small cubes showing high risk gives you insights into the overall level of risk you're currently taking. The exact timing of intervention depends on your own risk tolerance level, but utilising the cube in this way you can plan measures and mitigate specific risks to yield a stable overall risk exposure.

Developing a tax disruption and digital transformation strategy

Now you should be in a good position to develop a tax disruption digital transformation strategy for your tax function that is not only effective, but also has a good cost-benefit ratio in a world of budget and resource constraints.

The core objective of the strategy would be to bring together digital technologies, the organisational structure of the tax function and risk mitigation activities to preserve planning security in a rapidly changing and increasingly transparent tax environment. Your future tax function should be able to provide greater value to the business by generating more

insights and effectively assessing and mitigating risks in real time. To achieve this, it's important to take into account the internal and external perspectives as described above.

From an internal perspective, you have to forecast the future demands on the tax function, rethink the combination of technology and professional resources, and plan to reallocate resources accordingly. Take into account issues like: what tax-related inefficiencies can be identified? What kind of technology might improve tax function processes and performance, and how? What areas could yield the most promising returns? You can compile a list of processes fit for automation and technology suitable for the task, for instance.

From an external perspective, it's necessary to determine what measures and technologies are needed to mitigate the new risks to make sure you can maintain the same relationship with the authorities as you have today. How can you deploy technology to retain control of the tax risk of the business as authorities deploy powerful new capabilities? How will you ensure that your tax team still has sufficient oversight and time to fulfil its role in the new world of tax?

A good tax disruption digital transformation strategy defines:

- A vision
- A tax disruption manager, or a 'CDO for Tax': someone who manages the change
- Objectives in the key areas displayed by the pyramid
- The targeted pace of progress, and
- Planned benefits.

In Appendix 2 to this guide, we have set out detailed descriptions of the stages that we believe tax functions need to progress through. This might serve as inspiration for your strategy.



Depending on the complexity and structure of your organisation, it may be useful to distinguish between different tax types in your strategy. Some organisations may want to pursue slightly different objectives, for example, for taxes on income and transaction taxes.

Establish global tax disruption change management

To implement the tax disruption digital transformation strategy, we recommend, as outlined before, making tax disruption management a separate discipline and making someone responsible for it. In this way you can attract adequate attention to the task to make it a priority, and create enough momentum to stress a system that is usually reluctant to change.

A tax disruption manager or 'CDO for Tax' could coordinate these actions, accelerate the transformation process and measure (and report) the change. They should manage the manifold implications and risks of the internal and external use of digital technologies for tax, and make sure that these internal changes are aligned with the broader organisational strategy around digital change.

b. Global tax narrative

One of the key issues in an increasingly transparent digital tax world with new supervisory powers is developing a globally coherent tax narrative.

We're not talking about simply adapting the narrative for new CbCR disclosures ex-post. To manage increased tax transparency, it will be crucial to monitor all the external information the tax administrations could possibly rely on, along with all internally-generated tax-related data, and maintain a tax narrative that will stand up to scrutiny against all these data sources, across all subsidiaries, jurisdictions and tax types. Only a globally coherent tax narrative can safeguard the organisation from unsuspected surprises and claims from tax administrations searching for inconsistencies. At the same time, demonstrating a coherent tax narrative will make it easier for companies to engage with multiple, incoherent tax authorities across jurisdictions.

Strategically planning a global tax narrative requires a change in mentality, away from a reactive mode towards a proactive mode. The first step should involve preparing and analysing information about the current tax narrative in every jurisdiction and for every tax type to identify obvious inconsistencies. The second step should be to evaluate the flows of data to the authorities and other relevant internal and external information sources, while reflecting on the current tax narrative and thus making sure that potential blind spots are recognised. The third important step is to make sure that your own data always supports the global tax narrative.

This is not an easy task. To be able to maintain and control the tax narrative over time and establish some kind of tax narrative supervision, the tax function needs advanced information collection and processing capabilities.

Establishing these competences will be our next topic.

Key territories (pooled level)

At this level we start to focus on measures that are directly related to technology. In general, technological solutions can be designed, built, tested and implemented, or alternatively (in some cases) acquired and implemented, either at local or global level. We think that in most cases it would be useful to pool together certain 'key' territories when implementing such tools. As 'key' is open to definition and depends on the specific structure of the organisation, it can refer to territories with the highest risk from a tax perspective, the most important ones from a revenue-creating perspective or perhaps the most progressive ones with the best technology expertise. Our suggestion would be to utilise the tax disruption risk framework (the cube) to identify the territories with the highest risk and use these jurisdictions as a starting point.

Let's take an example. A company has important markets in China and the USA. In both jurisdictions, the tax administrations have built big data collection capabilities. Simultaneously, the company wants to digitally enhance its tax teams in both jurisdictions. In this case it might be beneficial to bundle the two jurisdictions, building a joint tax data pool for both at once. If the project is successful, the tax data pool can be extended to cover other jurisdictions, creating a global tax data lake. If we now suppose that the Dutch and the Turkish tax administrations develop data analytics skills in the area of audit selection, the very same company may now pool both jurisdictions together to develop data analytics capabilities of its own in these jurisdictions with the goal of avoiding outliers the tax administrations might focus on.

We're aware that in this area companies are confronted with somewhat contradictory requirements. On the one hand, there is occasionally the need to provide tailored country-specific solutions; on the other hand, the aim is to achieve (data, oversight and tax narrative) consistency at global level. Relying heavily on local tools can have the long-term downside of not only high maintenance costs and reliance on a small number of specialists, but, more importantly, incompatibility with other digital technologies. Containing 'over-tooling' is another vital reason why we recommend a cross-regional approach.

c. Tax data management

The tax function may be one of the largest consumers of data in an organisation. Almost every corporate activity can have an impact on tax. Often data comes from the entire organisation, from areas as diverse as sales, supply chain and HR, lacking clear visibility and integration.

Currently tax experts spend much of their time copying, pasting and consolidating data from many different sources using spreadsheets. They must log into ERP systems, choose a report, download data, integrate it into a spreadsheet, transform data, and so on.

With the advent of digital tax administrations, this has to change quickly – for three reasons. Firstly, these efforts are too time-consuming, and tax experts will have to shift their priorities to new tasks. Secondly, they have to expand their data collection capabilities to keep up with the authorities.

Thirdly, they will have to demonstrate data reliability if they still want to be able to signal competence and good governance to the authorities.

In an increasingly transparent world, permanent establishment (PE) and other similar risks are becoming more crucial. For example, tax authorities that are able to analyse immigration (or flight) data on an automated basis may identify a permanent establishment where you yourself have not been aware of one. For this reason, the tax function has to make sure that it knows which employees cross borders when and for how long. It has to collect and analyse the necessary information; and it can't do it manually.

The first step for a digital tax function must be to establish a new form of tax-relevant data management or data competence. In the following we have categorised aspects of relevance that have to be considered for solid data management.

Identifying and extracting tax-relevant data

The increasing pervasiveness of information technology means that organisations produce a lot more data than they used to. However, the tax function usually neither owns any of the data nor is able to influence data generation. The tax function has to identify, filter and acquire tax-relevant information from across all business functions to enable timely responses to external challenges. The increasing complexity of organisations makes it more difficult to keep up.

Monitoring the digitalisation efforts of the rest of the company, the tax function has to make sure that other functions deliver their share of relevant data (in the best quality possible) by providing an API or establishing similar automated channels to the tax function. Automatically extracting data from existing applications, e.g. financial data or IFRS ledger/sub-ledger data, with technology for the purpose of tax should be a key objective to improve data sourcing. In addition, tax experts may want to exploit new data sources. To pick up the example from above, data from a digitalised calendar consolidated on a company-wide basis could help track the cross-border activities of staff and monitor PE risks.

At the same time, the tax function has to monitor information flows to the authorities, including data from third parties such as financial institutions and other intermediary information, to comprehend which information the tax administrations are taking as a basis for their decisions.

Cleansing and preparing data

Validating, cleansing and standardising the relevant data is an immense task. In our view, this is the current bottleneck of digitalisation and a significant challenge for corporate taxpayers. Being able to rely on good, structured master data and transactional data is key.

The tax function has two jobs in this respect. Firstly, it must make sure that it has a consistent and robust approach to standardising the data it consumes that has been generated elsewhere in the organisation. Tax-relevant data (data as diverse as trial balance data, data from corporate transactions and process memos, for example), must be

in a consistent format across jurisdictions so that it can be analysed from a tax perspective. Secondly, the tax function must take steps to standardise the data it produces for consumption across the organisation, such as tax codes, tax narratives and the like.

The tax function must use technology to automate the process of transforming unstructured data into structured data. Sophisticated optical character recognition (OCR) algorithms, as well as algorithms including natural language processing and machine learning, should be deployed to efficiently scan, extract and interpret information from paper forms and other unstructured data sources.

Storing and organising tax data (creating a data lake)

All tax-relevant data generated by a business should be stored in a consolidated organisation-wide repository that dispenses with organisational and regional data silos. Whether this is realised with a third-party (public or private) cloud infrastructure or a company-hosted cloud behind the firewall depends on the company and the relevant regulatory requirements.

This kind of centralised tax data pool or data lake/data warehouse is in essence a database created for the tax function pooling all tax-relevant data points. It deals with the problem of tax experts having difficulties finding the required data due to the common challenge of having a significant number of IT systems that can't talk to each other.

This kind of 'one-stop' tax database will be incredibly valuable, as it creates the basis for running analytics and more advanced machine learning tools to drive new insights. While this is a daunting task, this infrastructure doesn't have to be established all at once. You can start by pooling key territories and/or specific tax types, building smaller data pools and expanding them later, little by little.

Metadata management

Proper data management also includes metadata management. Metadata is essential in terms of providing insights into data flows, ensuring that data can be mapped from source to output.

Especially in the realm of tax, it can be appropriate to track the 'characteristics' of data: which account, entity or jurisdiction created information at what time. Metadata should also help when it comes to monitoring information flows to the authorities.

Data integrity and security

Last but not least, it's advisable to build trust in the data you transmit – one day the tax authorities will oblige you to prove data integrity in any case. Unlike data flows, data generation is a domain the authorities will not be able to control.

Maintaining one single point of truth (the tax data lake) and increasing data exchange with the tax administrations may leave companies vulnerable to new and more severe cyberattacks. Solid cybersecurity measures should be implemented to prevent fraud, sabotage and uncontrolled data leakages.

d. Technology for tax data analytics

Having established solid tax data management and built an accurate tax data lake, companies can now run sophisticated tax analytics.

As a first step, dashboards and other forms of visualisation can make data easier to understand, representing it in an accessible format. In a digitalised and increasingly complex environment, data volume grows. Data visualisation can help the tax function maintain an overview while providing meaningful insights. The next step is to use predictive analytics to support strategic planning. Historical data can be used to forecast the impact of changes. Prescriptive analytics, in turn, can be deployed to suggest how the tax strategy should be optimised.

Advanced analytics can thus support the tax function in four dimensions. It can help:

- Better understand the organisation's activities
- Comprehend the decision-making process of the authorities
- Strategically plan and develop a global tax narrative
- Exploit the remaining room for manoeuvre from a tax planning perspective.

The dimension a company seeks to advance first will depend on its specific needs and the requirements of the relevant tax administrations. To reach a decision, tax leaders should fall back on an initial assessment like the cube.

Analytics for a better understanding of the organisation's activities

Tax data analytics can help you understand internal data by discovering trends within tax filing cycles (typically quarterly), annual trends (such as underlying income, inflation and tax payment growth) and even monthly trends in the data in areas such as indirect taxes and exports/imports.

More importantly, tax data analytics should help you detect and mitigate tax disruption risks arising from new insights gained by the tax authorities. Let's return to the example of PE risks we discussed before. Identifying a permanent establishment is not easy. Projects can be extended or prolonged, more employees may be called to join or be sent elsewhere spontaneously. Getting this information in time is a tough challenge for the tax function, especially because in most cases, it can't draw on the immigration or flight data the authorities might have access to. However, analytics algorithms building on good data sources and utilising other sources such as calendar, HR or travel data can also monitor PE risks (and may even be able to do it better) and sound the alarm automatically.

Analytics for comprehending the decision-making process of the authorities

Another important field for the application of advanced analytics relates to one of the key questions in the new world of tax: Will you understand the data in the same way and before the tax authorities do?

To be able to understand the authorities' tax assessment and argue against the algorithmic outcome at the same data-driven level, corporate taxpayers have to build their own analytics models using similar logic. In this scenario, we will witness an interesting development, because the models of the tax administrations will have an entirely different perspective than those of multinational enterprises. While the former can rely on the information of many companies, but mostly in one jurisdiction, the latter can draw on information from just one company but in many jurisdictions. It will be interesting to witness how this comparison will turn out. With the implementation of these types of algorithm-based platforms, companies should be able to build a solid line of defence to an algorithm-equipped authority.



To this extent, advanced analytics can be used to assess how different tax authorities apply transfer pricing or permanent establishment rules for companies, or how they perform the principle purpose test, for example.

In contrast to the first dimension, advanced analytics is deployed here for a different purpose, though there is some overlap. The first dimension is more about creating insights and being compliant; the second dimension is more about ensuring that the tax authorities share your point of view, and applying the law correctly.

Let's look at another example to clarify what we mean. In a highly automated environment with high volumes of data transactions like indirect tax, the tax authorities will soon have digitalised many steps to determine the tax burden. During the automation process, the local tax administrations will have implemented rules to avoid double taxation. Now, it is possible that different tax administrations have divergent interpretations of tax treaties or have implemented the rules differently. Corporate taxpayers have two options. They can rely on the implementation decisions and algorithmic outcomes of the tax authorities, or they can build their own models to evaluate where they pay taxes, trying to avoid double taxation in such a highly automated environment.

Analytics for strategic planning and developing a global tax narrative

Shaping a globally coherent tax narrative that holds true for all jurisdictions and tax types is only possible if tax leaders are capable of monitoring and assessing the information flows to the tax administrations checking for incoherence. In particular, they should be able to detect information flows potentially deviating from the tax narrative early on. For this reason, this dimension focuses on analysing information exchange or transfer flows.

Considering the huge amount of data we're talking about, it should be clear that this could not be a manual task, no matter how many people your tax function is able to assign to the task.

Analytics for exploiting the remaining room for manoeuvre

Even though in the transparent, real-time tax world of the future, tax optimisation opportunities will be significantly smaller, they will still be there. To remain capable of action and sustainably exploit the leeway that remains, companies must fully understand their data and the data-driven perspective of the tax authorities. That again is only possible if you are utilising the power of advanced analytics algorithms.

Predictive analytics, for example, can predict the consequences of regulatory changes, changes in business models, corporate transactions or substantial investments, providing insights into future tax allocation. Prescriptive analytics will be able to use statistics and algorithms to determine what an organisation should do in areas such as asset management, legal entity structure, trading partners, geographic locations, investments and operational transfer pricing to best execute their tax strategy.

This will allow you to exploit the remaining room for manoeuvre more efficiently and with less risk than would be possible in the old world of tax.

e. Technology for tax data processing

On top of analytics, digital technology and automation tools can support your tax function in two additional fields. They can help when it comes to preparing and cleansing data, i.e. providing data (e.g. for the tax data lake), and they can take over tasks in areas like local and global tax reporting and tax return preparation, CbCR reporting and transfer pricing, i.e. utilising prepared data (e.g. from the tax data lake).

More and more tax management teams realise that working with complex Excel spreadsheets containing formulas that rely on one or two tech-savvy employees to maintain is an operational risk in its own right that must be addressed.

Below we will highlight tools and techniques that are suitable for tax data processing. We will start with small-scale and less advanced ones, moving to more sophisticated and complex solutions. The technology you deploy first depends heavily on your targeted speed and priorities according to your initial risk assessment. Whether you want to progress slowly, incrementally or in great leaps should be specified in your tax disruption digital transformation strategy.

In general you can say that technology will be able to automate rule-based and repetitive work in two ways: either by precisely mimicking the tax expert's work steps or by replacing them and changing typical work procedures. In both cases, it will free up the workforce for more analytical and strategic tasks.

Extract, transform and load (ETL) tools

To start with the most basic step of automation, extract, transform and load tools can best be imagined as an advanced Microsoft Excel tool. The main objective of ETL tools is to adjust raw data in a way that fits the needs of the tax function and consolidate data from different sources into a single file. The benefit compared to Microsoft Excel is that it allows you to create repeatable and transparent workflows and process large amounts of data significantly faster, and that it is compatible with various formats.

RPA

Robotic process automation software (RPA) can also undertake the work of transforming and importing data from various sources. But, unlike ETL tools, RPA repeats the task in the exact same way as the tax expert. RPA also performs the task directly in the graphical user interface (GUI) environment, meaning that as soon as the original GUI, tool or process changes (a button moves from top left, to top right, for instance), the bot must be adapted as well.

For this reason, we believe that RPA is particularly suitable for very basic (low-value) tasks unlikely to change significantly, like downloading data from existing systems. RPA can efficiently export trial balances or fixed asset ledgers from ERP systems, for example. Another field of application would be to convert data in a way that overcomes media discontinuities between different systems.

A conservative and incremental approach to the digital transformation of the tax function should seriously consider combining RPA with ETL tools to automate day-to-day work in a similar way to what you are used to. For example, RPA can help automate the data extraction component, while ETL tools will automate data preparation.

Dashboards/cockpits

Basic visualisation tools, already mentioned in the data analytics section, can help in terms of data processing as well as making workflow steps transparent and improving governance. When does a task start or end? When is it due? Who is responsible for the task? What are the predecessor/successor tasks? At a glance, the real-time status of all activities can reveal where tax teams are in the process of report creation, for example.

This category of tools can also provide templates for reports that are directly connected to the results of tax calculations. This means that if the calculation is updated in an Excel spreadsheet or another tool, the figure changes in the report as well, keeping it up to date automatically without human intervention.

Chatbots and similar functions

Chatbots and similar functions are more complex to develop. The idea behind this technology is to make knowledge and expertise available more quickly and easily by building a system that can search and respond to frequently asked questions. This can be either knowledge sent from other business functions to the tax function, such as establishment details, ownership structure and payroll locations, or tax expertise going to other functions, such as previous-year tax treatments, statutory tax rate changes and transfer pricing guidelines.

The main advantage of this kind of technology is that it eliminates time-consuming responses to manual inquiries.

Tax app catalogue

Tax functions following an incremental task-driven approach to digital transformation will gradually broaden their portfolio of automation tools for specific tasks, providing the tax function with some kind of 'tax app catalogue'. This catalogue will contain various automation tools going beyond the categories introduced above.

Electronic collaboration tools, for example, would allow multiple tax experts and tax teams to work together in a virtual environment on a common task.

Tools that implement the logic behind different reporting standards and tax legislative environments can then also be implemented, enabling tax experts to transform data (between US GAAP, data/or to IFRS data, for instance) with one click. Another example in this area would be an automation tool for tax reconciliation to get rid of the time-consuming work involved in making sure that tax figures actually match accounting figures.

Also worth mentioning are tools that prepare and transform information in a format that tax authorities demand, e.g. XML files like SAF-T, or provide the authorities with direct insights into tax-relevant company information.

Machine learning for data processing

The next major step in the digital evolution of the tax function will be the deployment of machine learning (ML) algorithms. Machine learning algorithms have the big advantage of being able to learn on their own and take in changes in the process as well. The output of the algorithm modifies itself as data is processed. All the other automation approaches mentioned before are exclusively rule-based. This means that rules have to be defined manually first, and changes in the process have to be manually updated in the rulebook of the app/tool/dashboard, etc.

On the downside, ML algorithms need big volumes of structured data to be trained. This means that you should do your data management homework and have a solid data lake in place before seriously considering a ML approach.

In return, ML algorithms can be very powerful. To name just a few examples, they can learn to explore structured data sets, as well as unstructured data (e.g. documents, emails and contracts), and extract relevant data for tax purposes, or they can learn to classify millions of data points from multiple financial systems and automate the tax classification work. Automating tasks like classifying items in trial balance to determine the tax category, or categorising expenses based on tax rules, location, time of day and so on can save thousands of hours.

The final technology environment: a unified tax portal

In our view, the digital tax function of the future will combine a number of the above technologies to create a fully integrated 'one-stop' tax portal.

A single platform like this would connect people across the tax function, including stakeholders outside tax such as finance and tax-relevant external intermediaries. It would provide secure and direct access to raw data, documents and reports, workflows, and analytics across numerous computing devices. Integrated dashboards, visuals and analytic tools would provide the necessary insights to fully understand the organisation's activities, monitor data flows to comprehend the decisionmaking process of the authorities, strategically plan tax issues and track down tax systems that best reflect your way of operating. Automated notifications would create reminders for tasks and sound the alarm if risks were likely to materialise. Increased workflow transparency would make responsibilities, compliance status and due dates immediately visible. Integrated scenario modelling and similar analytics would help preserve planning security in a fast-changing environment and make sure that the tax authorities apply and implement the law correctly in a highly automated future tax environment.

Entities (local level)

At entity level, small local tax teams usually deal with local tax administrations, addressing the distinct requirements of this jurisdiction in their daily routine.

At this level, we have therefore summarised measures that may differ from jurisdiction to jurisdiction and are best applied in a way that factors in the special features of the local tax teams, such as different styles, qualifications and attitudes towards progress.

Consulting an initial assessment like our tax disruption risk framework should provide the head of tax with the necessary information on where to set priorities systematically.

f. Manage the transition phase

As outlined in Part 1, tax administrations are busy creating a transparent, high-control tax environment, increasing their scope and placing new requirements on your tax function. As tax authorities will take different approaches to achieve this aim, local tax teams must prepare to face these country-specific challenges.

The necessary local preparation can range from being able to provide data in a specific format or use specific software for digitally filing returns, through to having to use distinct communication channels on a mandatory basis. In many cases, the necessity of responding to a sudden increase in inquiries questioning the current tax narrative will require the support of technology or growing numbers of staff. At the same time, local tax teams have to be briefed with some form of crisis strategy so that they can respond appropriately if the local tax authority discovers an unexpected skeleton in the cupboard by dragging tax-related inconsistencies into the open. All these measures heavily depend on the characteristics of local administrations. Is there any scope for negotiation during the transition phase to the new world of tax, for example, or are they pursuing a zero tolerance strategy?

What's more, local change management efforts should be made to help the local teams transition. A member of the local tax team should be put in charge of driving digital transformation at the local level. This means making sure that technology developed at a higher level is adopted properly and that local staff are trained accordingly. It also includes updating the tax team process in the light of technological advances, monitoring the change and reporting to the tax disruption manager in charge or the head of tax.

g. Improve daily tax team processes

Deploying technology isn't a one-dimensional endeavour. Technology also has, or should have, a major impact on workflows and processes, resulting in organisational change designed to eliminate redundant effort.

Let us take a very basic example. Merely replacing a manual Excel workflow with an automated ETL tool workflow to adjust and consolidate raw data influences the traditional process. Staff originally tied to the manual workflow are suddenly freed up, but only after being blocked to build the ETL workflow in the first place. Instead, some new routine

(naturally less time-consuming) has to be implemented, specifying who is allowed to adjust the automated workflow and under what circumstances, and how the changes are documented.

Major topics will include how to deal with increased volumes of data, how to coordinate tax data management and how to harness electronic communications options. New processes have to be established that define how access to a centralised data lake is granted, balancing ease of access and security, and how new data sources can be added to the data lake to prevent inaccuracies and duplication. New modes of digital collaboration have to be explored to allow tax experts to work together or with other internal and external stakeholders, for example in a virtual environment, on a common task.

Reengineering traditional processes will be a daunting task. However, we are convinced that major efficiency gains will result, not only from the deployment of technology, but also from the accompanying process and workflow changes.

h. Develop staff

As routine tasks are automated and machine learning algorithms are introduced to interpret data, tax experts will be able to redirect their time to focus on more important and highly technical tasks such as analysis, interpreting legislation, forecasting, strategic planning and management support, as well as business partnering. The qualifications tax staff require to be successful will change. This will mean that tax experts have to evolve in two directions, developing their skills, abilities and competencies.

Tax specialists must acquire new technological skills to facilitate internal and external automation, manage data, use advanced analytics, and so on. This will involve being able to understand and work with software developers and data scientists to create new machine learning models, for example. In the future, specialists in RPA, machine learning and other automation technologies will be a natural and integral part of every tax team.

On the other hand, tax staff will also need to place more focus on their interdisciplinary and analytical abilities, competences like creativity and agility, as well as collaboration skills. Tax people will have to leave their silo. The ability to build relationships and influence decisions across business functions and jurisdictions will become key for tax.

i. Monitor and report tax administration progress

Last but not least, local tax teams should report on the progress of their local authority in terms of digital transformation on a regular (at least annual) basis to the discipline that handles tax disruption management. This information can then be fed into a centralised model such as our cube.

Closely monitoring tax administrations around the world and understanding the nature of the true drivers of the new digital and transparent world of tax will be crucial for corporate taxpayers, and should form the basis of every decision related to the digital transformation of the tax function.



Concluding remarks

With this guide on tax disruption, we have sought to bring together all the external digital factors with an impact on the tax function, and have attempted to forecast what this will mean for the tax function of the future. The role of tax in the organisation will change significantly over the coming years, and this will necessitate significant investment, both in time and resources, to develop an organisation that is fit for this future environment. Failing to enhance capabilities could lead to new costs for the business and a significant change in the relationship between the taxpayer and the tax authority: Tax disruption could be very uncomfortable for organisations that do not prepare.

However, unlike most change in this world, tax disruption is plannable, which means that corporate taxpayers can do something about it. With a comprehensive risk assessment and planning framework, companies can get ready for this new world of tax. There are many frameworks available to manage change, but in our view only a robust risk assessment framework (our cube) coupled with a means of managing and aligning change across the organisation (our inverted pyramid) will make sure that you develop in line with external changes and that you do so in the most cost-effective and efficient way possible. With a structured approach, tax disruption can be managed to provide additional benefits to the entire organisation.

We hope you have enjoyed reading this guide. As with all forward-looking documentation, ours is a point of view and is by no means the only solution to this issue. The only way we as a profession of tax experts can get to the right answer together is by engaging in discussion and debate around topics that impact our industry. We would welcome your feedback and thoughts. Please do get in touch and join the discussion!

Appendix 1

Detailed descriptions of the stages of tax disruption

In this appendix, we provide detailed descriptions of all stages of tax disruption with regard to tax administrations. Based on our observations and discussions, the following trends are becoming apparent:

Stage One: Old, familiar world of tax

This stage describes the old, familiar world of tax. The tax authorities are only able to obtain limited data about the taxpayer, most of which is provided directly by the taxpayer in the tax return or other disclosures. Decisions about prioritising risk and selecting audit candidates are based on the experience of the tax inspectors. In some areas, rule-based algorithms support the decision-making process. The audit is conducted by sample testing of data, often by the tax inspectors on site. In the event of a negative audit outcome, taxpayers will face penalties for the wrong tax return, and sometimes suffer reputational damage.

Stage Two: Providing more information (already the current position for many authorities)

In recent years, many tax administrations have proceeded to this stage unnoticed. Authorities have focused on unlocking new data streams with changes in disclosure regulation (e.g. new reporting obligations like Base Erosion and Profit Sharing ('BEPS') or mandatory e-invoicing obligations). Although these data are still provided by corporates (affording some control over the information flow), they provides the authorities with significantly more information about the operations of an organisation than was available previously. Authorities have also improved their supervisory capabilities. Risk evaluation is now often done by machine learning algorithms, which improve over time, while tax inspectors mainly focus on outliers identified by these algorithms ('technologically enabled compliance risk management'). Algorithms are increasingly deployed to support the audit process to handle the growing amount of information available. Personal liability for company officials for incorrect tax returns is more common in the more advanced jurisdictions.

For business, this stage will not feel much different from the 'old world of tax'. This is dangerous, because progress in developing new capabilities goes largely unnoticed, with a slight shift in focus of the authorities being the only noticeable change. Companies or industry sectors not in focus before might suddenly appear in the spotlight, for instance. However, a general increase in the number of audits can be expected given the reduced marginal cost of identifying audits made possible by digital technology.

Stage Three: Collecting more information

This is the first stage that could already feel disruptive if a company is completely unprepared. The taxman will have established an important new way of information sourcing from open sources and third parties. The unlocking of new data streams is mainly driven by technological progress (e.g. payroll/accounting software integration or the ability to 'scrape the web')²⁰. The ability to collect comprehensive data that is not provided by the company itself makes the taxman a lot more independent in his assessment. In addition, companies lose some of their control over the data streams to the authorities. This changes the whole tax game in a truly disruptive way.

Progress will be seen in the area of audit selection as well. Machine learning algorithms will take over more tasks like prioritising risk and selecting audit targets, while the outcome will only be subject to moderate control by tax inspectors. For some tax types, mainly transactional and similar tax types, real-time tax auditing by algorithm will be deployed by this time. This means that audit selection becomes redundant for these tax types, because the audit process will cover everyone. For the other tax types, an audit will be sourced with a lot more information than before, some directly extracted from the systems of the company. At this stage a completely new, but very significant, hazard will emerge. The authorities will now be processing so much essential and crucial information about a company's business model that data loss or data mismanagement by the authorities (e.g. a successful hacking attack on the government database) would pose a real threat.

In general, companies that are unprepared will face more and potentially unsettling questions from tax administrations because of all the new insights gained from independent sources. The taxman might question statements in the tax return and ask for additional clarification. In areas where real-time auditing is rolled out, questions will arise a lot more quickly, reducing the time window to react and prepare explanations. The resulting 'compression of time' will be challenging on its own. Imagine if you received 400 such inquiries a day across the business. How would you cope?

Stage Four: Automated auditing

Stage Four implies the general stage of tax disruption. Substantial (and automated) information sharing with other countries' tax authorities will provide the tax authorities with extensive new insights about a company's worldwide value creation and business model. The silos between capabilities in separate tax departments are broken down to yield connected supervision of all tax types within a jurisdiction. In many countries, this huge step towards transparency is probably sourced by a centralised data pool. Numerous

²⁰ Companies are pursuing their own digital transformation. As they do so, they are producing a lot of data on a large scale. Just think of developments like the industrial Internet of Things, cloud computing, digital supply chain management or the new trend to experience management, and how useful this data can be for determining where value is created or if there is sufficient 'substance'.

jurisdictions will use this information to do real-time auditing, covering every taxpayer, for the other tax types too. Instead of testing sample data, audits will now examine huge cross-function data collections ('automated auditing'). Tax inspectors will only intervene manually in rare cases, e.g. if the algorithms indicate fraud on a large scale. Companies will face a new type of sanction, for example if they fail to provide the necessary data in the appropriate quality to the authorities, or if they are not able to prove the integrity of their data.

At this stage, companies will experience a true and disruptive change in their relationship with the authorities. Companies will now clearly experience the 'network analytics effect' described at the beginning of this section. The more information the tax administrations around the world share and the more they independently learn about a company, the more insights they will gain exponentially, and the more they will exude confidence and impose higher standards. Tax administrations will not accept information only provided by the company if it is not backed up by reliable data. Collecting and preparing this information manually will multiply the workload and confront the tax function with an impossible task if it is not equipped with (automated) data collection capabilities beforehand – and especially if the timeframe gets even narrower. In addition, companies will find it hard to challenge administrative decisions if they don't speak the same data-driven language.

Stage Five: Automated taxation and full transparency

Stage five is the stage of full transparency. The taxman has sufficient capabilities and access to data to calculate an organisation's tax burden without any specific reporting from the taxpayer themselves. The authorities will run fully integrated platforms, which extract data directly from the company's systems, intermediaries and open sources. At this level, taxpayers will stop preparing their own returns, with the tax administration taking over this job in many countries. We call this step 'automated taxation'. At the same time, ordinary audits and the process of tax audit selection will become obsolete. We will probably observe a shift towards an audit of IT systems, the integrity and reliability of data and the processes of data collection. Accordingly, the authorities will likely establish another layer of sanctions, ones that bite if corporate taxpayers fail to implement adequate data management processes to provide the necessary data in the correct format and within the specified timeframe. A by-product of this move towards data collection is an increased risk of cyberattacks on direct data flows to the authorities. Corporates need to make sure that this data exchange is secured to avoid becoming a victim of data stolen as part of the data exchange process.

It's at this point when taxpayers will feel all the consequences of the new world of tax. The tax authorities will now perform most of the tasks originally the conducted by the internal tax function. This does not mean that the company's tax function has become obsolete – not at all. But its purpose will have changed dramatically. Instead of preparing the tax return, 'new' tax experts will have to ensure that the necessary IT systems are up and running and transport the desired tax-relevant data, for instance. They will have to certify the integrity of the data, oversee and steer the whole system, and maintain the tax narrative. At the same time, they will need to ensure that management understands the tax picture, monitoring and visualising the data for the board and executive.

Stage Six: The new world of tax

In the more distant future (but not as distant as you might think), the emerging brave and transparent new world of tax will have manifested entirely. Additional government departments will have closed the technological gap (or other more advanced departments will have absorbed them), and will share the data collected by themselves with the tax authority. In addition, the majority of countries will have reached a stage where they are able to run fully integrated platforms and participate in automated data exchange programs. This level of information, only accessible to the authorities, will paint a picture of the company and its activities from many different angles and yield another increase in supervisory powers. All taxpayer data will be compared in some form of expectancy model. Automated taxation is rolled out for all tax types. As the next step we might even see some form of automated tax payments.

Certainly some countries might choose not to be entirely part of this transparent tax world for political and cultural reasons. They will probably be in the minority and come under strong pressure from other countries to become part of the new transparent world of tax.

Assessment hallmarks

Tax Authorities

	Access to taxpayer data	Tax return preparation	Audit selection	Audit process	Sanctions/damage
Stage One	Tax return and other disclosures	Taxpayer	Risk assessment and prioritising mainly manually by tax inspectors, sometimes rule-based algorithm	Manual sample testing by inspectors (often on site)	Tax due + penalties for wrong tax return Reputation
Stage Two	Disclosures, and wide-ranging mandatory reporting obligations	Taxpayer	Risk assessment by machine learning algorithm, prioritising by inspectors focusing on outliers	Sample testing by algorithm, manual sample testing by inspectors (often on site)	As above, adding personal liability
Stage Three	Vast own data collection capabilities independent from taxpayer	Taxpayer	Risk assessment, prioritising and selection by algorithm, supervised by inspectors, real-time auditing of everyone for some tax types like e.g. VAT (no selection anymore)	Extended sample testing by algorithm, sample testing by algorithm with directly extracted data (remote or on site), rare, selected manual testing by inspectors on site	As above, including extended personal liability, and risk of data loss/mismanagement by the authorities (including hacking of authorities' database)
Stage Four	Extensive information exchange: Including data from other tax types, other jurisdictions (automated) 'Network analytics effects'	Taxpayer	Risk assessment, prioritising and selection by algorithm, only partially controlled by tax inspectors; real-time tax auditing by algorithm for more tax types	Testing based on huge cross-function data collections by algorithm ('automated auditing'), mainly remote, rarely on site (fraud)	As above, adding risk of inappropriate data quality, unproven data integrity
Stage Five	Access to all data required to determine tax (direct data extraction; fully integrated platforms)	Authorities (automated taxation)	No selection necessary anymore, real-time tax auditing by algorithm with more information for all taxpayers and all tax types	Shift towards IT and process audit	As above, adding risk of inappropriate internal tax processes and risk of hacking of direct data flows to authorities
Stage Six	Including data from other public sector departments	Authorities (automated taxation, automated payment?)	Real-time auditing by algorithm with more information	IT and process audit	As above

Traditional methods
 Disruptive methods

Appendix 2

Detailed descriptions of the stages of progress for companies

In this appendix, we outline the predefined stages of progress for companies as we did previously in Appendix 1 for the authorities. The stages of progress for companies are defined in such a way that they mirror the stages for tax authorities and allow a direct comparison:

Stage One

The tax function has to select and extract structured financial data manually from ERP accounting systems (such as SAP or Oracle). Typically, significant post-processing of data is required to get it into a usable format. Non-financial data from the business about processes and the value chain is gathered from the business via interviews and email. Different kinds of information are stored in separate storage solutions, but not linked. Owing to the many different data formats and storage solutions, analytics can only be applied to a very limited extent. Tax risk management is largely conducted manually and relies on the individual expertise of tax experts in the company.

Tax specialists prepare and file the annual tax return using manual processes, with additional procedures conducted by the tax function. Reporting is done on an ad-hoc basis for each jurisdiction individually. The tax story is therefore not aligned, and a combination of data from different sources is interpreted and used differently. The company has only limited oversight of all tax-relevant data shared with external parties. Tax function responses to scrutiny from the authorities are manual and ad hoc as issues arise (firefighter mode). Tax experts are not assisted by any decision support systems in their daily work.

Stage Two

The first step will be for corporate taxpayers to establish a new form of data competence. Among other things, this includes at least partially automated data extraction from ERP and other systems made possible by cleaned and structured tax-relevant data supported by improved ERP functionality or tax-specific extraction tools, better data sourcing, more uniform data storing, and standardisation efforts. Business data is gathered by way of a structured questionnaire or the like to prepare unstructured data for processing. Tax specialists will be supported by basic automation, such as robotic process automation, optical character recognition technology or data science tools. Excel add-ons and basic extract, transform and load ('ETL') tools will be used on a routine basis to gradually move away from simple Microsoft Excel manual processes.

Some basic 'descriptive' analytics will be available to the tax function to support tax analysis, and a formal approach to assessing and managing tax disruption risk over the next years is in place. The tax function is beginning to have

a good oversight of all data shared with external parties. Responses to tax administrations' assessments remains a manual task, conducted by tax experts, but they will be in possession of more information to provide substantiated responses.

Stage Three

At this stage, companies will have digitally transformed their tax function with new data management capabilities. Tax-relevant company data is tracked, monitored and visualised to better understand the authorities' view. Third-party data is starting to be included. More sophisticated automation tools, such as NLP, are used to extract and interpret unstructured data such as textual responses in automated questionnaires. To some extent, 'artificial intelligence' platforms will help to prepare tax returns and other disclosures.

More sophisticated 'advanced analytics' will be rolled out to better understand the tax risk profile of the organisation and quantify the likelihood of receiving an algorithmically-determined audit from the authorities.

The tax function has developed a coordinated overview of information flows and disclosures to external parties. New analytics abilities are available on aggregate disclosures which enable it to understand, adapt and defend the global tax disclosure 'story', consolidating the newly available amount of information.

Stage Four

This stage describes the level where full digital capability and technology are available. This means that tax-relevant financial and similar data are automatically extracted and stored in a global, centralised data pool for all divisions and entities within the group, without human intervention. Tax related APIs or the like integrate into business systems and process tools to automatically extract business-relevant data to the central data pool, removing the need for tax-relevant 'declarations' to the tax function. Tasks like tax return preparation and filing are largely automated, but still 'conducted' by the taxpayer. Human intervention is limited to a review of returns and handling complex tax-related matters involving interpretation, transaction support or similar.

Analytics platforms will be improved using machine learning elements to enhance predictions of audit/risk. The tax discipline will be heavily supported by algorithmic systems in the fields of tax strategy and planning. For example, real-time automated assessment of disclosure fields will be able to automatically identify disclosures that might diverge from the overall narrative and therefore pose a risk. In addition to data-driven responses, corporate taxpayers are able to compare the decisions of tax administrations in one jurisdiction with decisions in others to strengthen their point of view.

Stage Five

In the more distant future, the authorities will have established, and will force taxpayers to establish, a highly automated tax environment (see Stage 5 in Appendix 1). The task and focus of internal tax functions will thus shift fundamentally.

Since authorities will now have their own access to tax-relevant data, tax experts must refocus their compliance efforts on monitoring data feeds to tax authorities (and other third parties that could serve as data providers to the authorities). They must ensure completeness and timeliness, and should be able to use this data to replicate the likely view of the authorities to report to management so that the business is not blindsided. Taxpayers will only be able to influence or control the creation of data; they will no longer be able to control the data flow itself. Tax return preparation is taken over by the authorities, and internal tax experts must review the proposed outcomes.

With compliance duties taken care of outside of the organisation, companies will have developed automated tax risk mitigating capabilities able to predict future data flows and intervene earlier in the process. At the same time, comprehensive, predictive modelling capabilities will be in place to predict and test compliance proposals from authorities, to defend the company's own view and develop a rationale for conclusions on a real-time basis. Tax planning and strategy capabilities will be equally enhanced by algorithms and integrated platforms, reflecting authorities' shift of audit focus towards IT systems, data flows and processes.

Stage Six

Not available for taxpayers.

Assessment hallmarks

Companies

	Collecting financial data and other structured data	Collecting qualitative business information	Tax return preparation (technical; document assembly)	Risk management analytics	Reporting (strategical; tax plan and coordination)	Response to tax authority audit/assessment
Stage One	Manual selection and extraction of data from ERP Significant post-processing required	Data gathered via interviews and emails.	Manual	Limited analytics possible as data is not available in a structured way; Manual tax risk management	Reporting done on an ad-hoc basis for each jurisdiction individually; limited oversight of all data leaving a company and being shared with authorities	Manual by tax experts
Stage Two	Automated extraction and storage of all tax-relevant and previously structured data	Data gathered by structured questionnaire (with help of e.g. RPA)	Some processes automated (e.g. RPA)	Basic 'descriptive' analytics available to tax department to support tax analysis; tax disruption risk management in place	Tax function has good oversight of all data being shared with external parties Beginning to align tax narrative over tax types	Manual by tax experts with more information
Stage Three	Tracking and monitoring of tax-relevant data and data flows including third-party data	More tax-relevant business data is digitalised and structured (with help of e.g. NLP)	More processes automated (e.g. NLP)	Advanced analytics using some machine learning elements	Coordinated with other jurisdictions (globally consistent tax narrative developed)	Able to respond at same data-driven level
Stage Four	Global, centralised tax-relevant data pool	Automated extraction and storage of all tax-relevant business data in same global tax-relevant data pool	Automated to large extent	As above with more information	Tax strategy and planning heavily supported by algorithmic systems, mainly controlled ex-post by central tax unit	As above, but with comparison to authorities' decisions in other jurisdictions
Stage Five	Monitoring data extraction flow to authorities, only creation of data still controllable	Monitoring data extraction flow to authorities, only creation of data still controllable	By authorities, only possible to control authorities' outcome	Automated tax-mitigating capabilities, which are able to intervene (partially) autonomously in real-time, if necessary	Algorithmic tax planning, risk mitigation and strategy with new focus on own IT systems, data flows and processes	Comprehensive, predictive own modelling capabilities to predict test authorities' outcome and defend own view

Contacts



Dr. Christian R. Ulbrich
Tax Disruption and Technology
+41 58 792 23 16
christian.ulbrich@ch.pwc.com



Stuart Jones
Tax Disruption and Technology
+41 58 792 45 16
stuart.jones@ch.pwc.com



Christoph Schärer
Chief Digital Officer, Tax and Legal
+41 58 792 42 82
christoph.schaerer@ch.pwc.com