

# Tax Administration Digital Maturity Assessment Model: Big Data, Portals & Natural Systems

Survey results

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**Prepared by FTS of Russia**

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## Foreword

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This paper presents the results of testing of the Tax Administration Digital Maturity Model. The testing outcomes were obtained through the survey conducted in December 2016 – February 2017 by the Federal Tax Service of Russia (FTS) in cooperation with Australian Taxation Office (ATO) and the FTA Secretariat. This work was done within the implementation framework of the FTA E-Services and Digital Delivery (ESDD) Project. Prior to circulating the survey among the FTA tax administrations, members of ESDD Project Advisory Group took an active role in the initial testing of the Model and provided valuable inputs in its improvement.

The goal of the paper is to provide insights for those tax administrations that wish to proceed further with increasing their digital maturity in area of Big Data as well as portals and natural systems.

The opinions expressed in this paper are the sole responsibility of the author and do not necessarily reflect those of the OECD or the governments of the member countries.

## Introduction

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At the March 2015 Forum on Tax Administration (FTA) Bureau meeting, the Commissioners endorsed a proposal by the Federal Tax Service of Russia (FTS) for it to lead a project aimed at exploring the latest developments in information technology that could enhance service delivery by the revenue bodies, particularly focusing on developments in E-Services and Digital Delivery (ESDD).

This project continues the FTA series of studies focusing on service delivery by the revenue bodies of the FTA member countries.

To assist the FTS in delivering the project, an Advisory Group was formed with representatives from the revenue bodies of Australia, Denmark, New Zealand and Singapore. The Advisory Group has defined and endorsed the scope of the ESDD project as:

- Identifying emergent information technologies, especially in the area of digital delivery and e-services that can enhance service delivery in revenue bodies, and describing how these can help address service expectations of taxpayers; and
- Exploring in detail two of the key areas identified: portal solutions and natural systems, and Big Data management.

In 2015 and 2017 the FTS and the Advisory Group conducted a series of workshops in Moscow and Singapore and progressively and collaboratively developed a Tax Administration Digital Maturity Assessment Model (the Model). The Model is a self-assessment tool designed to help tax administrations determine the level of digital maturity of their e-services and digital delivery in the areas of Big Data and Portals and Natural systems.

Following its' original publication in *Technologies for Better Tax Administration* (OECD, 2016) the Model was revised by the ESDD Advisory Group and was subject to several iterations of enhancements and improvements. The revised version of the Model provides tax administrations with a tested tool allowing them to assess and determine the level of their

maturity across two important areas of digital operations: Big Data and Portals & Natural Systems.

The revised Model (i) uses open questions to frame the intent of each category; (ii) removes references to particular technologies/solutions and instead focuses on what they achieve; (iii) introduces clearer categories and terms; and (iv) uses more active and descriptive language.

The Model delivers a simple to use tool that does not require in-depth knowledge of information technology. It provides structured incremental descriptions that allow revenue bodies to easily identify their level of digital maturity across a range of capabilities and also suggests potential areas of focus for administrations for moving to the next phase of maturity.

The Model is not intended to be used to compare tax administrations or to specify best practice. The purpose of the Model is to allow tax administrations to (i) determine their level of digital maturity; (ii) identify areas for further attention and investment; (iii) identify common patterns at different levels of maturity; (iv) enable strategic conversations; (v) help identify best practices to facilitate discussions and exchange of ideas/experiences; and (vi) contribute to capacity building in other tax administrations.

The Digital Maturity Survey was distributed in December 2016 to the FTA member countries. By the survey deadline, the ESSD Project team had received responses from 26 tax administrations: Australia, Austria, Canada, Chile, China, Costa Rica, Denmark, Finland, Hungary, Ireland, Israel, Italy, Japan, Netherlands, Norway, Philippines, Poland, Republic of Korea, Russia, Slovakia, Slovenia, Spain, Sweden, Thailand, United Kingdom and United States. The results of the survey were presented and discussed in April 2017 at the Third ESDD Workshop that was hosted by the Inland Revenue Authority of Singapore.

The survey was made anonymous. The country names were removed from the survey responses by the FTA Secretariat and responses forwarded to the FTS and the ATO for compilation and analysis. Tax administrations that may wish to contact countries that have assessed themselves as having leading practice should get in touch with the FTA Secretariat that will disclose the name of such country with its consent.

Following an outline of the methodology of the Model the paper further proceeds to presenting the results of the survey of 26 tax administrations that have tested the Model and presented their results to the FTA Secretariat. It also provides recommendations for the future application and development of the Model.

## Model Methodology

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In striving towards being contemporary digitally mature organisations, tax administrations need to determine, as their starting point, the degree of maturity that they currently have in delivering digital services.

The Tax Administration Digital Maturity Assessment Model was developed to facilitate tax administrations in making self-assessment of their digital maturity levels in the following areas that constitute two sections of the Model: use of Big Data and use of Portals and Natural Systems. Given the course taken by the ESSD Project, the Model currently focuses only on Big Data Management and Portals and Natural Systems capabilities. These aspects have formed the

core content of the digital maturity survey conducted by the ESDD project. The scope of the model might be expanded, provided the FTA members find the format and approach useful.

The Model allows administrations to self-assess against a range of capabilities including technological, business process, people, data and change management. These features were identified by participants of the first E-Services and Digital Delivery Project workshop in Moscow in July 2015. They were examined further at the second Workshop that focused on Big Data and portal solutions and use of natural systems. At this stage, other features of revenue bodies' digital maturity have not been addressed, but may be the focus of future work by the FTA.

This Tax Administration Digital Maturity Model delivers a simple to use instrument that does not require in-depth knowledge of information technology. It provides sequential references that allow revenue bodies to easily identify their level of digital maturity across a range of capabilities. It suggests potential areas of focus should an administration want to move to the next phase of maturity (Dyche, 2015; Nikolic et al., 2014; Fath-Allah et al, 2014; Forbes Insights, 2015; Halper and Krishnan, 2013; Halper & Stodder, 2014; Sanger & Thomas, 2015).

The OECD report *Increasing Taxpayer's Use of Self-service Channels* (OECD, 2014) approaches the evolution of digital self-service. It provides the basis for positioning case studies from revenue bodies on both successful and unsuccessful self-service strategies. The Digital Maturity Model is offering to address the issue from a technology rather than from a service perspective.

Across its two sections the model offers 10 categories of assessment which are further subdivided into 34 questions with each of them measured against five possible self-assessment phases extending from nascent to emerging, adoption, advanced and leading practice.

The categories of the **Big Data section** in the Model include: organization, capability, infrastructure, governance and data.

The **Organization** category allows tax administrations to self-assess how well their organisational culture is able to support and promote use of Big Data in developing new, convenient services for the taxpayers and improving compliance, including senior executive sponsorship, collaboration between business and IT functions, and access to data across the administration.

The **Capability** category includes self-assessment questions aimed at determining the maturity of various capability aspects required to leverage Big Data in tax administration to become intelligence-led organisations, including data sharing, issue resolution and self-service, investment in advanced data analytics and staff proficiency in using analytic tools.

The **Infrastructure** category examines the elements of IT infrastructure that are essential to transition from a transaction based to a data-driven organisation, that is able to support real to near-real time collaboration with taxpayers, improve service delivery and reduce costs.

The **Governance** category helps to identify what processes and controls are in place for data management across the tax administration.

The set of questions in the **Data** category help determine the level of digital maturity by looking at data quality, centralisation, acquisition and use of Big Data, and unstructured data in particular, all of which should be guided by a clear overarching data strategy.

The categories of the **Portals and Natural Systems section** of the Model include: online tools and services, whole of government single entry point, engagement, products and services and support to transition.

**Online Tools and Services** category assesses digital maturity of the online tools and services offered by tax administrations by looking at availability of online information, security of digital transactions, segmentation and personalisation in delivering end to end digital services.

**Whole-of-government Single Entry Point** category helps to make an assessment of how the tax administration entry point integrates with other government services.

The **Engagement** category looks into how mature tax administrations are in co-designing their products with their users and third parties, including co-production and co-delivery of tax information and services in taxpayers' natural systems.

**Products and Services** category examines how mature the revenue bodies are in collaborating with software developers and 3<sup>rd</sup> party service providers and integrated delivery of e-services within the natural taxpayer environment.

**Support to Transition** category assesses the level of staff preparedness and ability to bring the digital vision of their tax administration to life, looking both at the level of new capabilities being developed and provision of integrated in-channel support across all digital channels.

To achieve more practical results it is recommended that users of the model should first introduce themselves to *Technologies for Better Tax Administration* (OECD, 2016).



## Big Data

Big Data section responses are presented by overall Aggregates, Category Aggregates and Individual Question responses.

Infrastucture	1	5.0	5.0	4.5	4.5	4.8	4.8	4.8	4.8	4.8	4.0	4.0	4.0	4.5	4.5	4.5	4.5	4.4	4.4	4.0	4.0	4.0	4.0	4.0	4.8	4.5	4.5	4.8
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Given the distribution of the results, it can be observed that tax administrations are making significant investments in IT infrastructure to support their current and future outcomes as demonstrated by a high proportion of revenue bodies in the Advanced and Leading maturity stages. It is common for tax administrations to invest in various IT infrastructure projects and effective analytic tools, products and infrastructure. In many instances the survey found these investments to be aligned to current and future tax administration needs and business problems.

While it is common for tax administrations to create sandboxes and testing centres for experimentation and data discovery to extract additional value out of their data, actually very few of them have proceeded to introduce agile approaches as core practice.

Many tax administrations have matured to finance their IT infrastructure development on a par with other business programs. However in a few tax administrations IT still continues to be considered as a cost centre rather than a value-generating asset. The majority of tax administrations have not yet established processes to measure benefits and the return on investment resulting from treating IT as the value-generating part of the organisation.

Some tax administrations are expanding unified IT architecture platforms across their entire organisation. However most of them are only starting to consider building unified architecture or adopting unified ecosystem approaches to support their analytics and digital delivery of taxpayer services regardless of technology platforms.

Tax administrations have also progressed in their organizational support to adopting a data driven culture and establishing working relationship between IT and business functions as well as sharing of data across entire organisations. The average maturity level in the organisation category is located between the adoption and advanced stages.

Tax administrations are aware of the advantages of being a data driven organisation and exploring initiatives that may generate benefits. To support these developments some of them have introduced positions of Chief Data Officer or equivalent roles within their organisations. In advanced tax administrations data driven approaches are becoming common and Chief Data Officers are receiving more empowerment. A few tax administrations responded that they have embedded a data driven culture within their organisations across all aspects of their business including internal and external functions.

Successful use of Big Data is subject to the ability to establish data sharing culture across the organisation. In the early stages of introducing IT to an organisation it was common for IT departments to exercise full control over access to data. Less mature tax administrations exercise more of a silo approach with business segments undertaking their own data collection and analysis in an uncoordinated manner. This often involves little or no collaboration among different parts of organisation and results in, inefficient use of their existing knowledge base, weaker organisation and consequent loss of business opportunities.

Over the years tax administrations have progressed in developing working relationships between IT and business functions within their organisations. In majority of tax administrations these functions are working collaboratively or have formed joint teams to address data initiatives. Some tax administrations have matured to a strong collaboration including implementing unified approaches to data driven initiatives and their governance. Projects which are successfully implemented by multifunctional teams combined from IT and business



side experts can rapidly spread the advantages of a data driven culture throughout the tax organisation.

About a half of respondents claim to have a data sharing culture with none of the responding tax administrations noting that they do not have it. Mature tax administrations provide flexible data access for business users with some level of guidance and support from IT.

In a digitally immature organisation the priorities of the IT department for data are disconnected from the needs of data users and they do not provide efficient ways of resolving data related issues. IT experts take their time in responding to business departments' queries. To address the issues of data use and sharing, most tax administrations are now creating multifunctional teams or even data centres of excellence serving different parts of tax administrations.

Most tax administrations have now either started to explore and adopt analytical solutions to business problems or their staff is already advanced enough to think in terms of digital ecosystems that encourage innovation and enable users to explore new types of data and e-services across platforms.

Employment of self-service technology in analytics seamlessly integrated with legacy systems is also a feature of a mature tax administration. Most tax administrations have not reached this level. They are just starting to use self-service technologies, Big Data platforms and advanced analytics with the majority of them referencing best practices of other tax administrations or private sector companies.

The survey indicates that tax administrations experience problems with acquiring staff members that have enough knowledge to use self-service analytical tools and are capable of achieving objectives using agile development methods. In some cases tax administrations indicated that they only had a small number of people within tax administration capable of using analytical software. To improve their capability tax administrations need to consider taking a more active and open stance on bringing a Big Data and data sharing culture into their organisations as well as investing into developing the capacity of their existing staff.

Robust governance policies provide stewardship of data management across the tax administration. In a digitally mature organisation data governance would be well established and understood at all levels. Among all Big Data section categories the Data Governance category appears to have the lowest level of maturity. Existing tax administrations realize the need for governance and are in the stage of adopting data governance plans and putting in place processes to ensure adherence to those plans. Well established governance procedures are critical to successful transition to becoming a data driven organisation and tax administrations should focus on implementing their data governance standards.

The survey suggests that in many tax administrations development of data infrastructure outpaces development of data strategy. Such infrastructure allows users to access multiple data sources and types. In a majority of tax administrations business and IT managers are developing a holistic vision for data and data integration to facilitate development of new e-services. Some tax administrations have their data strategy already in place. However it is too early to conclude that tax administrations update their data strategies in an agile way to meet new challenges and to make best use of innovative technologies and growing knowledge within tax administrations.

Data quality constitutes the basis for the successful operation of any tax administration. Immature organisations can be described as having poor data quality and consistency. Typically they operate with low data volumes and do not use Big Data.

It takes time for tax administrations to identify the problem of poor data quality and uncover inconsistencies and errors contained in the databases, although they may be highly visible to end users and individual taxpayers. Clean data opens the opportunity to make use of available data as well as quickly integrate new data into the existing digital infrastructure. Clean data can also be used across operations to provide innovative approaches and technologies and to draw insights that create the environment for better compliance and delivery of services. The majority of tax administrations are investing significant resources to improve data quality.

In digitally immature organisations, uncoordinated collection of data by different business departments across the organization results in decentralized storage in disconnected silos. This impedes horizontal data sharing and effective analytics. Data centralization through a shared data resource is critical to having quick and timely access to consistent data. Most tax administrations are either working on data consolidation to provide constancy of data to all internal and external users or are already storing data in shared resources with administered data access rights. As a next step in their data consolidation efforts, tax administrations will need to focus on the creation of interfaces allowing seamless transfer of data between shared resources and from these resources to platforms best suited for making use of this data.

Immature organisations are not using Big Data. Typically they will be using simple analytical tools provided by spreadsheet software. Many tax administrations however have already realized the benefits of advanced data analytics and are becoming aware of Big Data. Such organisations are starting to practice some ad hoc querying and visualization based on descriptive analytics. Some tax administrations have advanced to using more sophisticated discovery and visualization tools, largely to analyse and manage tax compliance risks and inform the delivery of customer centric services. In a small number of tax administrations, use of Big Data is facilitating compliance activity, business processes and taxpayer services. Very few tax administrations have identified themselves as using Big Data in real-time or near real time to make tax assessments of individual taxpayers, deliver services and support no-return or pre-filled return approaches. Tax administrations should work towards using Big Data to bring taxation closer to transactions and focus on discovering ways of using data to improve compliance and insure seamless delivery of digital services.

Big Data discovery, involving use of multiple data sets of structured and unstructured data, enables trends and patterns to be identified that are hard to see through conventional tools. Tax administrations are data rich organisations with multiple channels of data acquisition. The majority of them are experimenting with bringing together different data sources and working on implementing new self-services analytic tools and digital services. A smaller number of tax administrations have advanced to using multiple data channels including multimedia for better understanding of taxpayer behaviour and developing change-responsive customized taxpayer services.

Traditionally tax administrations are developing their own data structure requirements for filling of information. They are also using data that may be structured by third party suppliers. Until recently digital use of such valuable unstructured data as texts, emails, video, voice recordings, social media and graphs was impeded by technology limitations. Available

technologies allow for fusion of unstructured data into analytic and digital service discovery tools supporting business processes. Many tax administrations still continue to use technologies involving only structured data which limits their understanding of taxpayer compliance. More mature tax administrations have advanced to using both structured and unstructured data, in the first place for identification and selection of compliance audits and decision-making. At the time of the survey no tax administrations were digitally mature enough to use sets of structured and unstructured data to support all business processes across the whole organisation. Tax administrations should work more actively towards using technologies opening the opportunity for use of unstructured data and blending it into their business processes.

### Portals & Natural Systems

Portals & Natural Systems survey responses presented by overall Aggregates, Category Aggregates and Individual Question responses.

Portals and Natural Systems	Online Tools and Services					Information Available																												
	WOG Single Entry Point					End-to-End Digital Services																												
	Engagement					Digital Services																												
	Products and Services					Authentication																												
	Support to Transition					Accessibility and Availability																												
						Service Delivery by Segment																												
						Level of Personalisation																												
						WOG Single Entry Point																												
						User-centred Design																												
						Third Party Involvement																												
						Natural Systems and Interplay																												
						Delivery of APIs																												
						APIs - Technology																												
						Staff Capability																												
						One-Channel Experience																												
ALL G	1	2	3	4	5	1.1	1.2	1.3	1.4	1.5	1.6	1.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.1	4.2	5.1	5.2
4.53	4.57	5.00	4.33	5.00	4.00	5	5	4	4	5	4	5	5	5	4	4	4	5	5	4	4	5	5	4	4	4	4	4	4	4	5	5	4	4
4.20	4.00	5.00	4.00	5.00	4.00	4	4	4	4	4	4	4	5	4	4	4	4	5	5	4	4	5	5	4	4	4	4	4	4	4	5	5	4	4
4.00	4.00	4.00	4.00	4.00	4.00	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.93	3.86	4.00	4.00	4.00	4.00	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.87	3.86	4.00	4.00	4.00	3.50	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.80	3.86	4.00	4.00	4.00	3.00	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.72	3.71	4.00	4.00	4.00	3.00	4	4	4	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.60	3.71	4.00	3.67	3.50	3.00	4	4	4	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.53	3.57	4.00	3.67	3.50	3.00	4	4	4	4	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.47	3.57	3.00	3.67	3.50	3.00	4	4	4	4	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.40	3.57	3.00	3.33	3.50	3.00	4	4	4	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.27	3.57	3.00	2.67	3.50	3.00	4	4	4	4	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.27	3.57	3.00	2.67	3.50	3.00	4	4	4	4	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3.07	3.25	3.00	2.67	3.50	2.00	3	3	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.93	3.25	3.00	2.67	3.00	2.00	3	3	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.80	3.00	3.00	2.67	3.00	2.00	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.67	2.86	3.00	2.33	3.00	2.00	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.53	2.66	2.00	2.33	2.50	2.00	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.47	2.66	2.00	2.00	2.50	2.00	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.47	2.66	2.00	2.00	2.50	2.00	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.40	2.66	1.00	2.00	2.50	2.00	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.13	2.71	1.00	1.33	2.00	2.00	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.07	2.71	1.00	1.33	1.50	2.00	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2.00	2.71	1.00	1.33	1.50	1.50	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1.67	2.29	1.00	1.00	1.00	1.50	3	3	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1.47	2.00	1.00	1.00	1.00	1.00	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Average Responses for Big Data: Overall, by Question Categories, and for each Question																				
Overall	Categories					Questions														
3.05	3.30	2.85	2.79	3.10	2.62	3.54	3.50	3.50	3.54	3.27	2.77	2.96	2.85	3.19	2.88	2.31	3.12	3.08	2.65	2.58

Portals & Natural Systems survey responses presented by Capability Categories and Questions ranked in order of Green ratings combined (4 & 5).



Online Tools and Services	1	4.6	4.0	4.0	3.9	3.9	3.9	3.7	3.7	3.6	3.6	3.6	3.6	3.6	3.3	3.3	3.0	2.9	2.9	2.9	2.9	2.9	2.7	2.7	2.7	2.3	2.0
WoG Single Entry Point	2	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0
Engagement	3	4.3	4.3	4.0	4.0	4.0	4.0	4.0	3.7	3.7	3.7	3.3	2.7	2.7	2.7	2.7	2.3	2.3	2.0	2.0	2.0	1.3	1.3	1.3	1.0	1.0	
Products and Services	4	5.0	5.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.5	2.0	1.5	1.5	1.0	1.0	
Support to Transition	5	4.0	4.0	4.0	4.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5	1.5	1.0	1.0	

Authentication	1.4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	2
Digital Services	1.3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	2	2
Delivery of APIs	4.1	5	5	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	2	2	2	2	2	1	1	1
Information Available	1.1	5	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3
End-to-End Digital Services	1.2	5	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	2
User-centred Design	3.1	5	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	2	2	1
Third Party Involvement	3.2	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	2	2	2	2	1	1	1	1
Whole of Gov Single Entry Point	2.1	5	5	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	2	2	2	2	1	1	1	1
Accessibility and Availability	1.5	5	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2
APIs - Technology	4.2	5	5	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	1
Natural Systems and Intergration	3.3	4	4	4	4	4	4	4	4	3	3	3	3	3	2	2	2	2	1	1	1	1	1	1	1	1
Service Delivery by Segment	1.6	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1
Staff Capability	5.1	4	4	4	4	4	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	1
Omni-Channel Experience	5.2	4	4	4	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	1	1
Level of Personalisation	1.7	5	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2

Many tax administrations are now exploring how they re-position their service offering to allow provision of the contemporary services taxpayers are seeking (OECD, 2016). The aggregated average for the Portals and Natural Systems section of the model suggests that the majority of tax administrations self-assess themselves as being either at the emerging or adoption stages of maturity with very few of them reaching an advanced level.

Easy access and use of websites is critical to facilitating compliance and digital service delivery. All responding tax administrations have an established web presence. Many of them still often provide basic static information about the tax administration itself with immature internal website search capabilities. A fair share of tax administrations support websites with up-to-date and easy to access information including real-time help such as web-chat. Customer focused websites that provide tailored information and proactive provision of digital services for taxpayers and tax administration staff are still in the infancy stage. In online real-time communications with taxpayers tax administrations are also progressing towards use of artificial intelligence.

Despite the fact that two-way non-digital interaction services with taxpayers are still widely available, tax administrations portals are commonly supporting digital two-way interactions and end-to-end transactions with taxpayers. In many tax administrations web services are efficiently integrated into portals with single entry point. For most activities taxpayers are generally provided with access to full digital end-to-end service.

Tax administrations are just starting to approach how to integrate their digital service delivery into taxpayers' natural environments. Seamless digital integration with third party software and taxpayer processes, making tax compliance a by-product of natural processes and systems, is nascent.

Most tax legislation mandates that tax administrations maintain confidentiality of taxpayer data. This means that provision of personalized online taxpayer service requires use of authentication methods. Many tax administrations provide personalized portal services requiring authentication which may include such methods as logins and passwords, personal identification numbers, shared secrets, digital signatures, tokens and code cards. More advanced tax administrations also calibrate their security control by sensitivity of data and are

starting to use biometric authentication technology. At the time of the survey there were no responses indicating integration of security access into taxpayers' natural environment or where taxpayers were no longer needing specialized knowledge to access personal online accounts or to memorise passwords. There was also no mention of tax administrations using Big Data analytical tools capable of identifying and responding to cyber-attacks.

The vast majority of tax administrations responded that they have reached a digital maturity level where they are providing a limited amount of services optimized for different device platforms. In a few cases it was reported that services are device agnostic and available in real time 24/7. Cases where all services are device agnostic are almost non-existent. In an effort to improve availability and accessibility of services tax administrations should continue with their efforts to make services available in real time and from any device or platform.

Tailoring of services to customer improves accessibility and ease of compliance. The survey indicates that there are still examples of tax administrations that do not structure their services in line with taxpayer segments. A much larger group of tax administrations have reached higher levels of maturity ranging from providing services that are partially structured by taxpayer segments to complete end-to-end delivery of tailored services developed from the user perspective. Service delivery in more advanced tax administrations services is personalized and often based around life events.

However there are still very few examples where portals are tracking individual user journeys, or identify their language and services preferences as well as provide geo-referenced services based on taxpayers current location. There are practically no cases where taxpayer personalization is proactively done in real time and can leverage additional facts based on Big Data available from internal and external sources and shared across different departments within the organisation.

To improve compliance and service delivery, tax administrations are increasingly using personalized data to enhance their digital interaction with taxpayers. Less digitally mature tax administrations provide personalized services using static data. Submissions and lodgements are batched and processed manually. In their interactions with tax administrations, taxpayers must manually transpose or enter information from other sources. The majority of tax administrations are providing mobile-optimised access to basic account enquiry, e-filing and e-payment options. Taxpayers are also able to save basic service preferences as well as import or download data for pre-filling of forms.

There are still many cases where the tax administration entry point is not integrated with other government services and government services are provided separately by each individual agency. It is common the a web portal of a tax administration will be linked to a whole-of government web portal and a separate security procedure will be required to access tax services. In some tax administrations services can be accessed from a whole-of-government portal using a unified authentication procedure. Leading practice examples where a single portal serves as an entry point to access all government services are rare.

More advanced tax administrations are trying to be responsive to user needs by designing their service applications in collaboration with taxpayers. However there are still examples of tax administrations that do not engage taxpayers in the development of services. In such immature



environment, services are developed based on an in-house understanding of what services are needed and can be offered to taxpayers.

As taxpayers themselves become increasingly digitally mature they are starting to put pressure on tax administrations to deliver contemporary digital services. In response to this pressure tax administrations are beginning to learn what is driving client demand. In many instances, though, digital services continue to be developed based on the “gut-feel” of tax administration staff.

A small number of more advanced tax administrations have progressed to developing digital services based on taxpayer feedback and expectations, with reference groups structured by segment and/or types of e-services. Leading practice cases where taxpayers and their representatives are involved in the development of digital services in an agile environment with frequent iterations of public and private beta-releases and rapid delivery are rare.

Many tax administrations do not engage with third parties to help develop and implement digital services. However it is more common for tax administrations to enter agreements with major third parties for service provision or, in more mature cases, actively collaborate with third parties covering most taxpayer segments.

Digital services embedded in natural systems and business processes used every day by taxpayers minimise compliance costs and encourage voluntary compliance. In most instances taxpayers must still regularly engage directly with tax administrations to fulfil obligations resulting in extra costs. Examples of limited pilot projects where integration of tax administrations’ and natural taxpayers’ systems are tested are very few. There were few responses indicating that major taxpayers or all taxpayers have the facility to interact with their tax administration through their natural system. Surveyed tax administrations did not report that their taxpayers are able to fulfil all their obligations through elements of their natural environment in a fully seamless way.

Application Programming Interfaces (API) are open sets of standards that describe how information can be exchanged between applications and services. They are based on the concept of open data, which is increasingly adopted by governments around the world (OECD, 2016). Examples of tax administrations not providing API’s and engaging third parties to integrate and develop software to support them are not uncommon. It is also fair to conclude that many tax administrations have advanced to developing APIs and testing them with third parties or started to engage third parties to integrate APIs into their services. Leading practice examples can be characterised by tax administrations having transparent API platforms allowing third parties to co-design and maintain services.

There is a growing understanding among senior management of the benefits of building internal capability to support API development and many tax administration have already implemented infrastructure capable of supporting and developing APIs. Only a few tax administrations have implemented a system that fully supports APIs resulting in seamless integration with third party services.

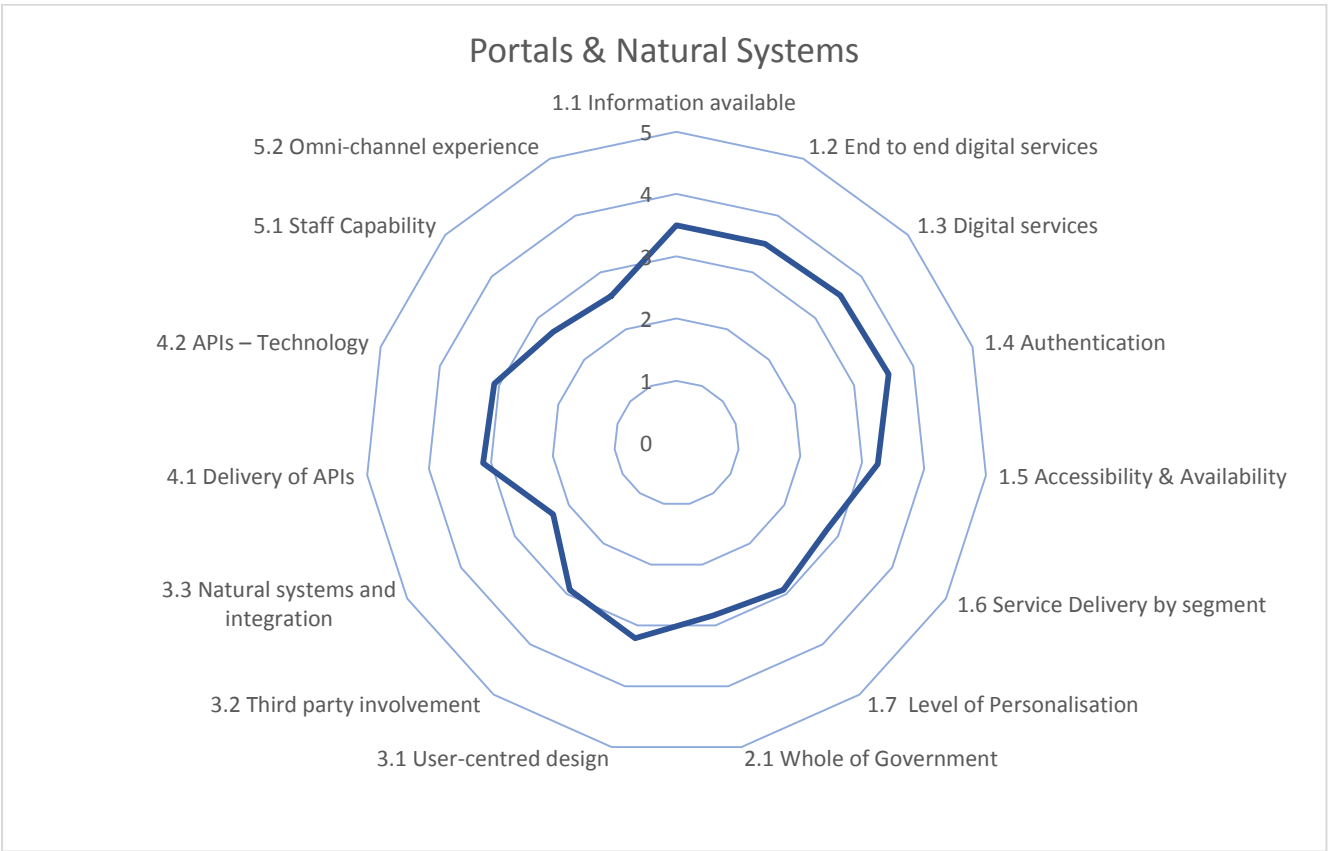
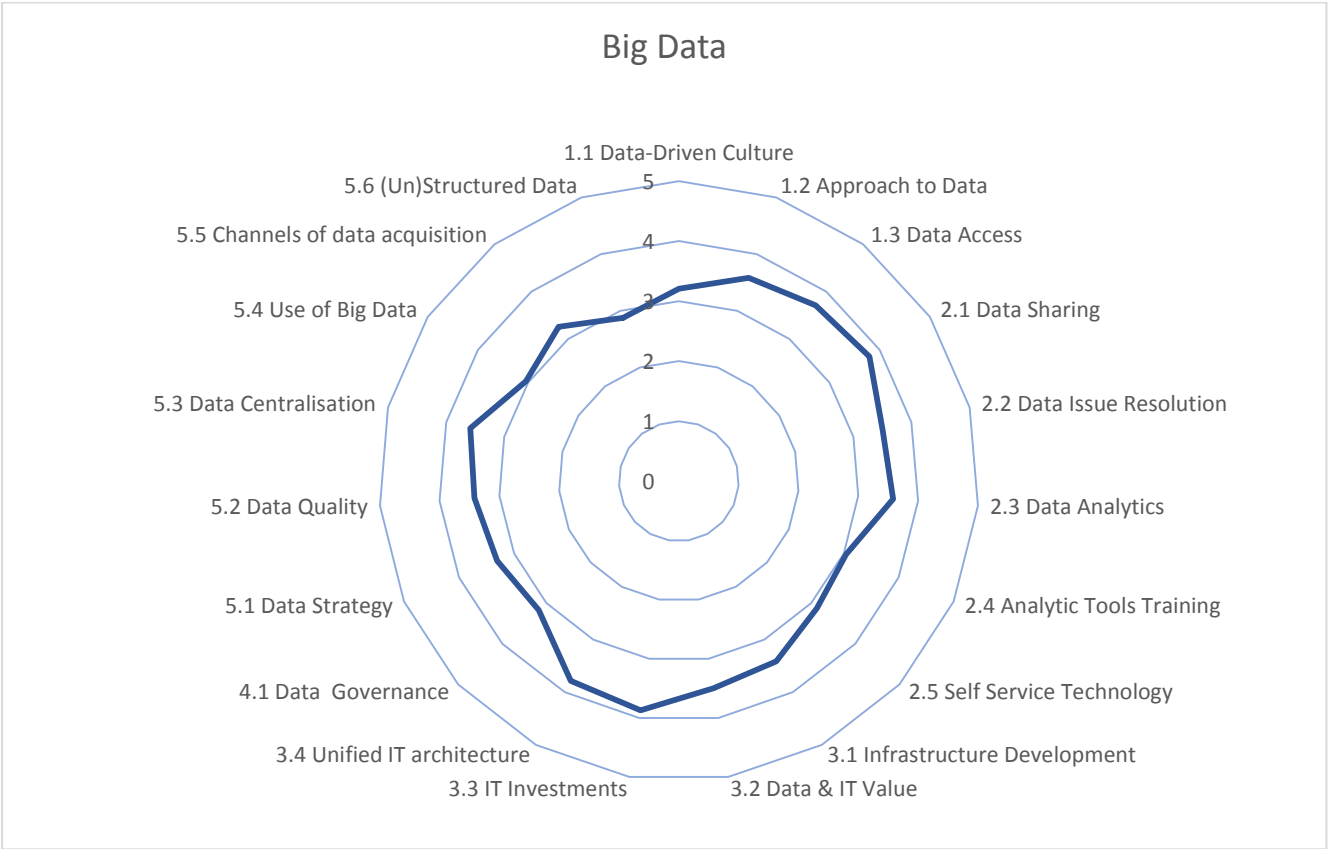
In the current environment existing staff largely support legacy roles and processes rather than working with APIs and natural systems. Senior staff of tax administrations realize the need for new skills and are preparing for this change. In a good number of tax administrations staff are gradually being re-oriented to work with API capabilities and roles and processes are being

overhauled. In some tax administrations most staff are already learning the new skills necessary to work with taxpayers' natural systems. Tax administrations have not reached the maturity stage where all staff have clearly assigned roles and are professionally qualified to work with natural systems.

Digitally mature tax administrations should be able to provide a seamless service offering across mobile and online channels and provide more intensive support for taxpayers that require it. There are still tax administrations that do not offer channel integration and taxpayers are required to restart the interaction every time they are changing communication channels. Tax administrations recognize the importance of establishing omni-channel experience and show increasing desire to integrate service delivery channels. Making available omni-channel service delivery is currently being tested by some tax administrations. A limited number of respondents have reported that services as part of their omni-channel offering are starting to become integrated to support seamless transitions across channels and automatic solutions are being deployed to support 24/7 self-service.

However the survey did not reveal the existence of tax administrations that have implemented a fully integrated seamless service offering across channels so clients can self-help or get intensive support as needed. Neither have surveyed tax administrations reported putting in place artificial intelligence solutions that facilitate delivery of taxpayer services. These advanced features of digitally mature organisations still remain challenges for tax administrations.

Average Adjusted Rating<sup>1</sup>  
Y Axis Legend: 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice.



<sup>1</sup> The Average adjusted rating excludes one bottom and one top rating to diminish the influence of outlying data.

## Conclusion

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Available Big Data technologies allow for the fusion of structured and unstructured data into analytic and digital service discovery tools supporting business processes. They offer better opportunities to enhance the operational capabilities of tax administrations to improve the management of compliance risks and provide customized proactive services for taxpayers. The majority of tax administrations have reached the adoption stage and started down the path to becoming more mature in using Big Data technologies. Tax administrations should work towards using Big Data to bring taxation closer to the point of transactions and look at ways of using data to improve compliance and ensure the seamless delivery of digital services.

This increase in digital maturity is being supported by significant investments in IT projects, effective analytic tools, products and infrastructure. To be more successful in implementing these initiatives, tax administrations should also look to introduce agile approaches into their practice.

Tax administrations have to focus on developing processes to measure the benefits and the return on investment from treating IT as a value-generating part of the organisation. Tax administrations should also be more active in developing unified ecosystem approaches bringing together their analytics and digital delivery services.

Tax administrations are aware of advantages being data driven organisations. Some of them are changing their management structures and introducing high-level positions to make the transition to becoming data-driven organisations. Tax administrations should continue introducing data-driven culture into their organizations across all their business.

In the majority of tax administrations, IT and business functions are working collaboratively to address data related initiatives. Senior management of tax administrations should continue to facilitate and provide strong support to collaboration between the different parts of their organisations.

Silo approaches to data collection, storage and analysis should be challenged and data sharing cultures established throughout tax administrations. As a next step in their data consolidation efforts, tax administrations will need to focus on creation of interfaces allowing for seamless transfer of data between shared resources and to platforms best suited for making use of this data.

Tax administrations are encouraged to use self-service analytic technologies and learn from the best practices of other tax administrations and private sector companies. Mature tax administrations provide flexible data access for business users with some level of support from the IT part of the organization.

The success of transition to a data driven culture depends on the availability of sufficient staff with enough knowledge to use self-service analytical tools and capable of achieving objectives using agile development methods. Capacity building within tax administrations needs to focus on building Big Data and a data sharing culture into their organisations as well as investing into developing the knowledge and skills of existing staff.

Tax administrations need to establish data governance procedures and implement data governance standards. To meet new challenges and make best use of innovative technologies, tax administrations should develop the capacity to update their data strategies in an agile way.

Big Data and multiple channels of data acquisition allow digital service offerings using web portal technologies to be significantly improved and open the opportunity to provide tailored information and the proactive provision of digital services for taxpayers and tax administration staff. Tax administrations should start exploring opportunities for using artificial intelligence in interactions with taxpayers.

Tax administrations should also more actively explore the opportunities to integrate services into taxpayers' natural environment and to seamlessly provide services regardless of the platforms used by taxpayers. This means becoming responsive to user needs and developing closer engagement with taxpayers and third party developers of digital tools. To achieve these goals, tax administrations have to develop and maintain transparent API platforms allowing third parties to co-design and maintain services.

Tax administrations also need to continue moving towards integrating their omni-channel offering to support seamless transition across channels as well as the automatic deployment of support for self-service offerings.

The survey and the underlying model present an effective tool for tax administrations' executive officers to see the current lay of the land and identify themselves as among the leaders, outliers or middle of the pack in any given criterion. However, it is clear that digitization is all about moving forward and progressing towards higher tiers of digital maturity. Tax administrations should take a look at what target levels of maturity they want to achieve in the foreseeable future. This will help countries build their individual pathways towards digital progress and align them with their strategic priorities.

Countries that have not yet taken part in the Tax Administration Digital Delivery Maturity Survey are encouraged to do so. Tax administrations should determine their level of maturity in each aspect and ensure their planning is aligned with their digital strategy goals.

The experience and knowledge of tax administrations with higher levels of digital maturity should be analysed to extract valuable lessons for the future development of tax administration.

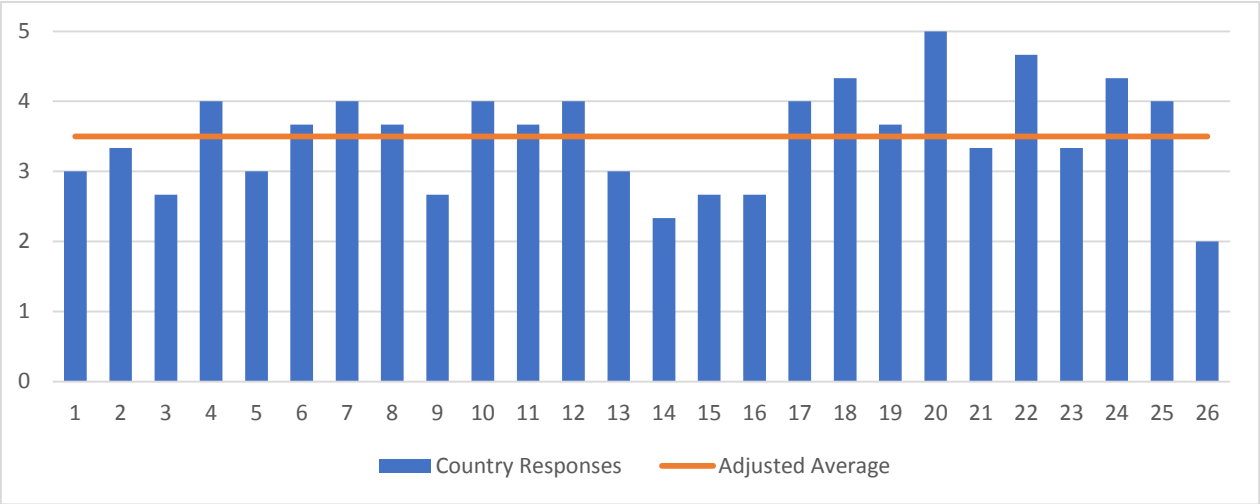


Observations by Category & Question - Big Data

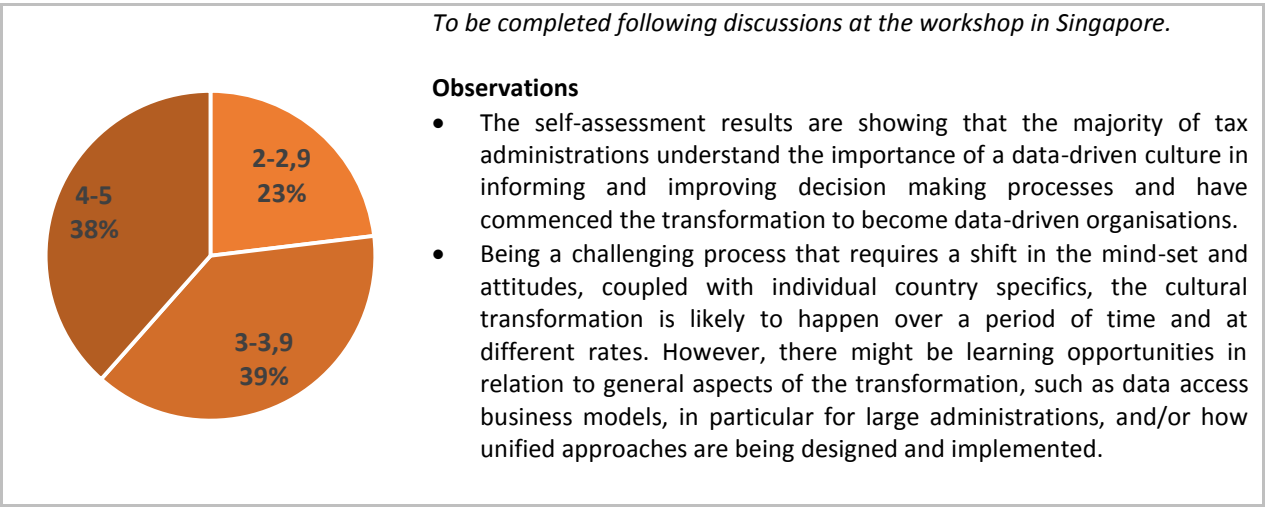
1. Organisation

This category allows tax administrations to self-assess how well their organisational culture is able to support and promote use of Big Data in developing new, convenient services for the taxpayers and improving compliance, including senior executive sponsorship, collaboration between business and IT functions, and access to data across the administration.

**Y Axis Legend:** 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice.



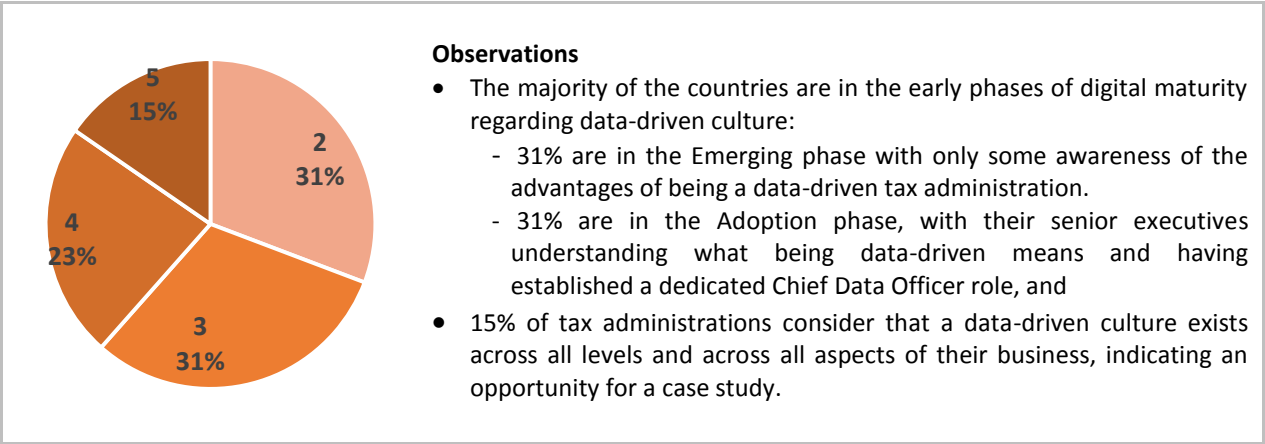
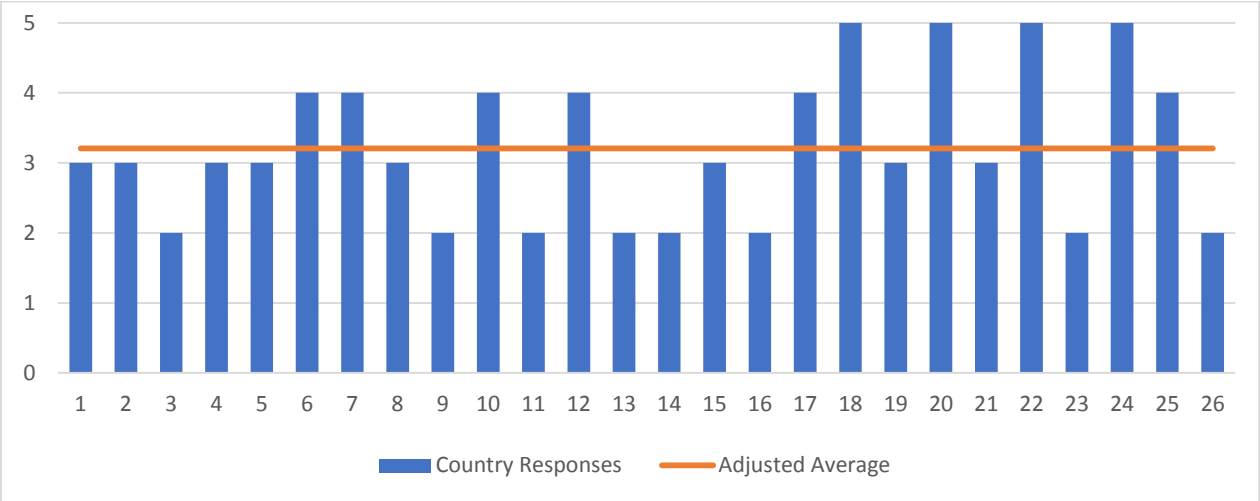
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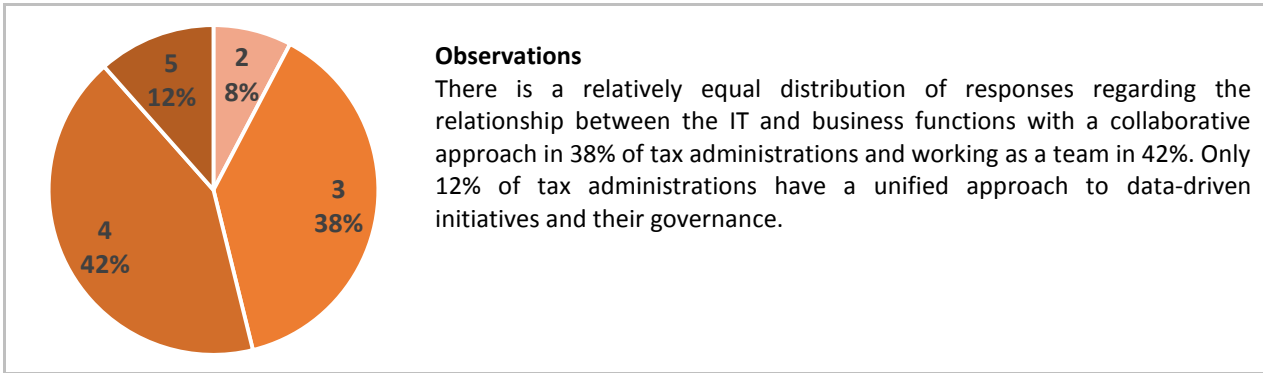
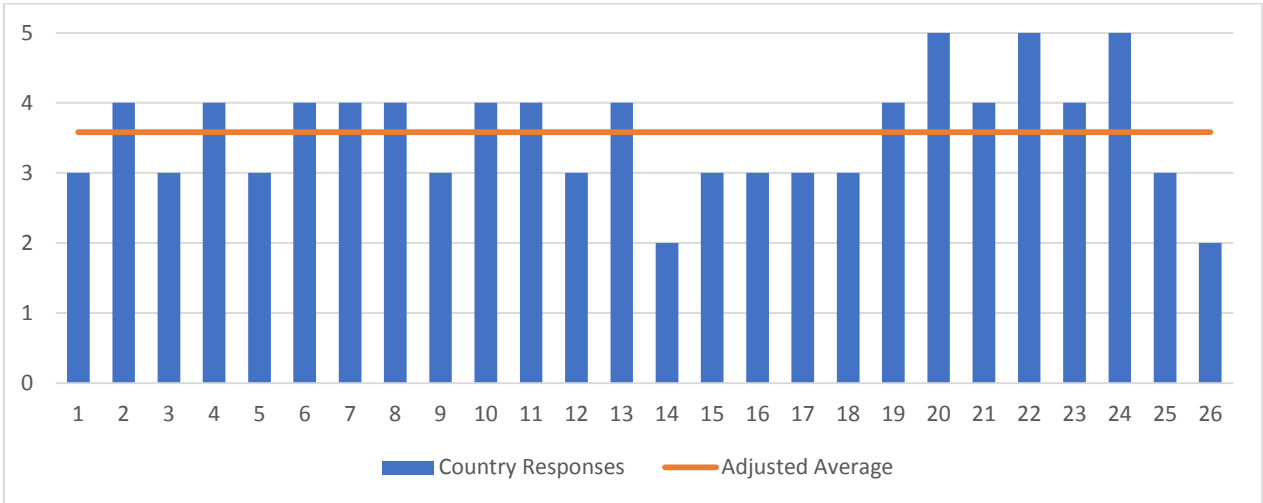
**Observations**

- The self-assessment results are showing that the majority of tax administrations understand the importance of a data-driven culture in informing and improving decision making processes and have commenced the transformation to become data-driven organisations.
- Being a challenging process that requires a shift in the mind-set and attitudes, coupled with individual country specifics, the cultural transformation is likely to happen over a period of time and at different rates. However, there might be learning opportunities in relation to general aspects of the transformation, such as data access business models, in particular for large administrations, and/or how unified approaches are being designed and implemented.

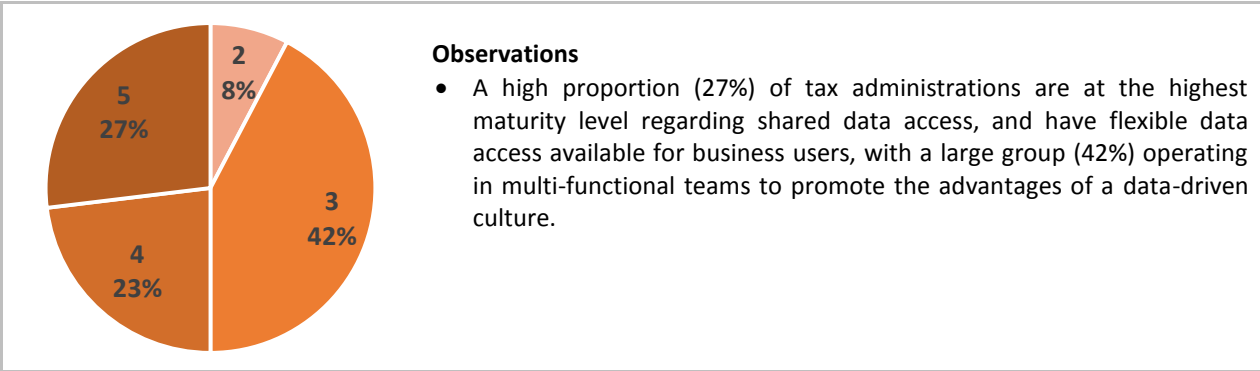
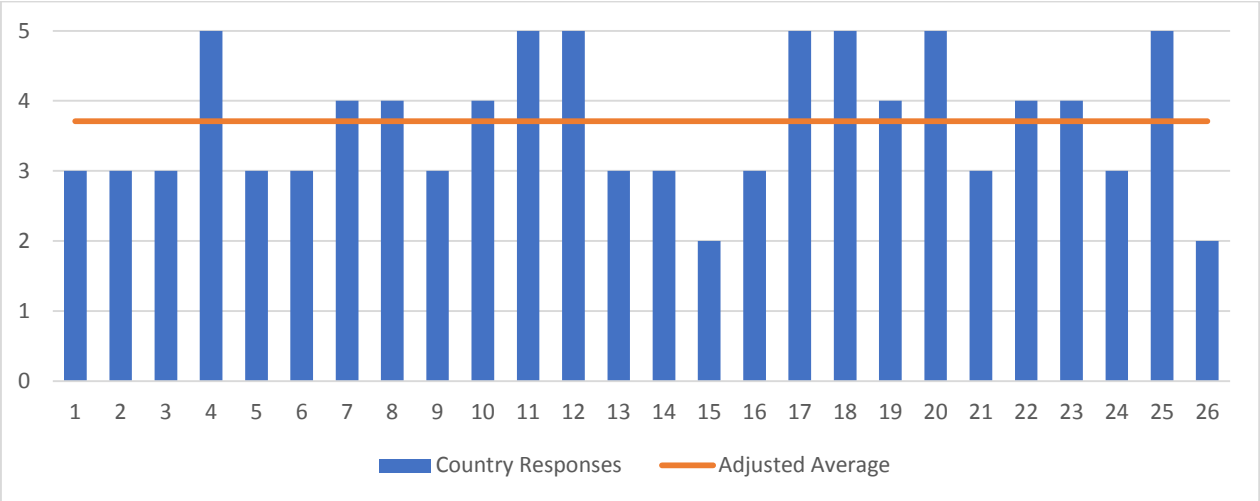
**1.1. Data-driven Culture.** *How much do the tax administration’s senior executives support a data-driven culture?*



**1.2. Approach to Data.** *What is the nature of the working relationship between IT and business functions for data initiatives?*



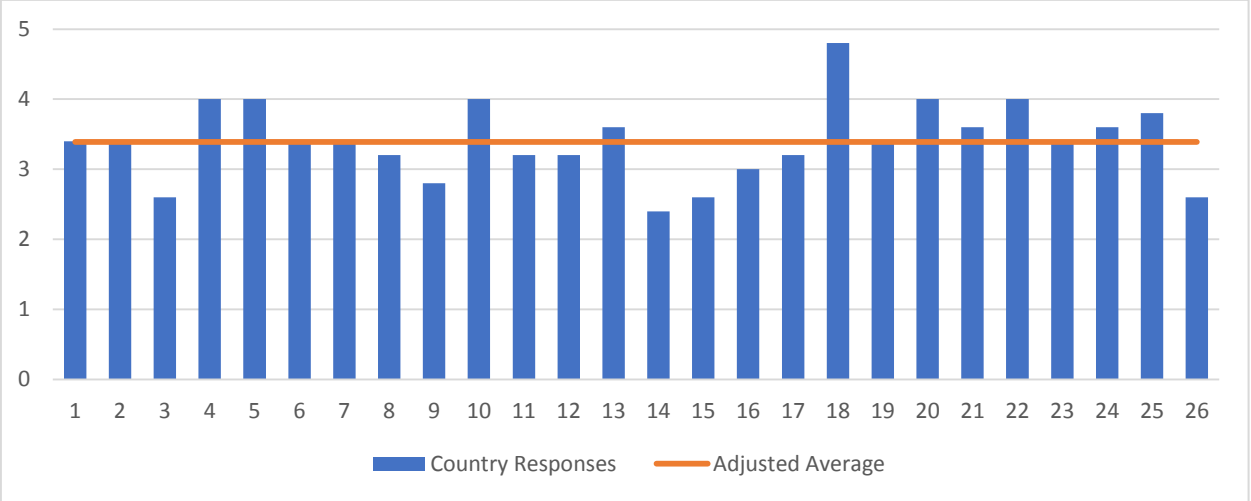
**1.3. Data Access.** *How much is data access shared across the tax administration, resulting in a data driven culture?*



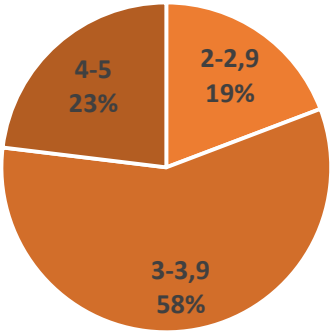
2. Capability

This category includes self-assessment questions aimed at determining the maturity of various capability aspects required to leverage Big Data in tax administration to become intelligence-led organisations, including data sharing, issue resolution and self-service, investment in advanced data analytics and staff proficiency in using analytic tools.

**Y Axis Legend:** 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice.



*To be completed following discussions at the workshop in Singapore.*

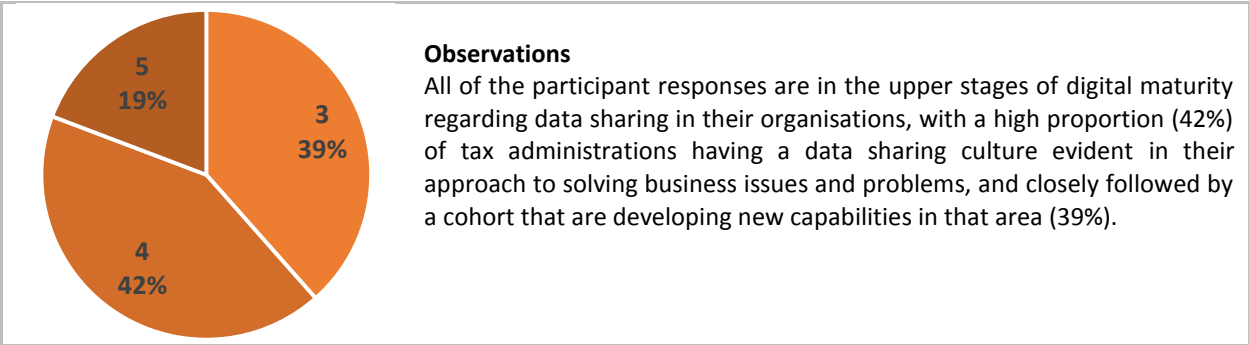
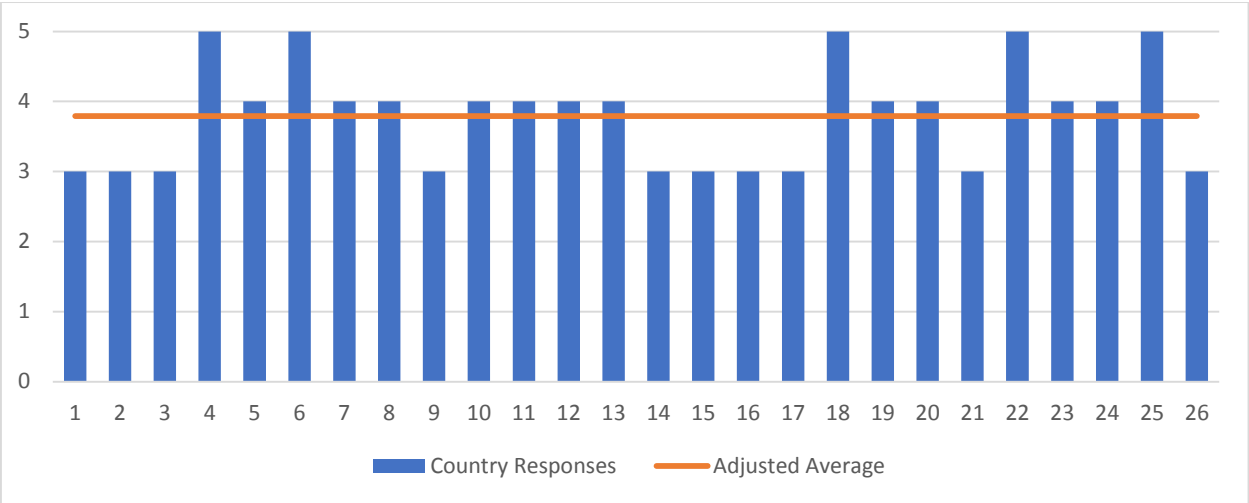


**Observations**

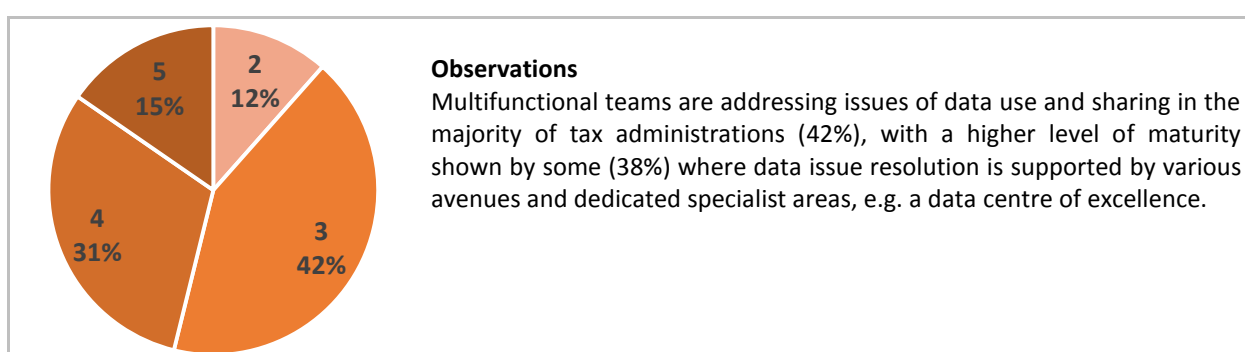
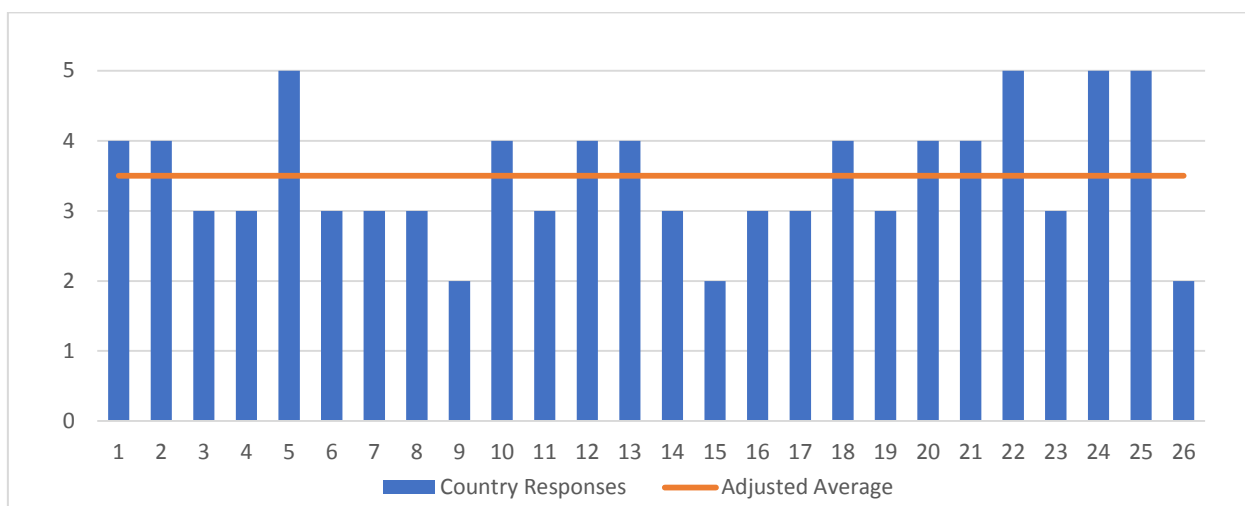
- While the level of maturity by the majority of tax administrations (58%) falls between the Emerging and Advanced phases, there are clear forerunners in this category, as well as some administrations right at the start of building their Big Data capability, which presents a case study opportunity to share experience.
- Furthermore, a closer look at the individual questions in this category reveals a lower level maturity in acquiring and developing new skill sets, and establishing self-service platforms, indicating that a discussion on these elements could be beneficial to understand the reasons and dependencies behind the ratings and inform future focus areas for the project.



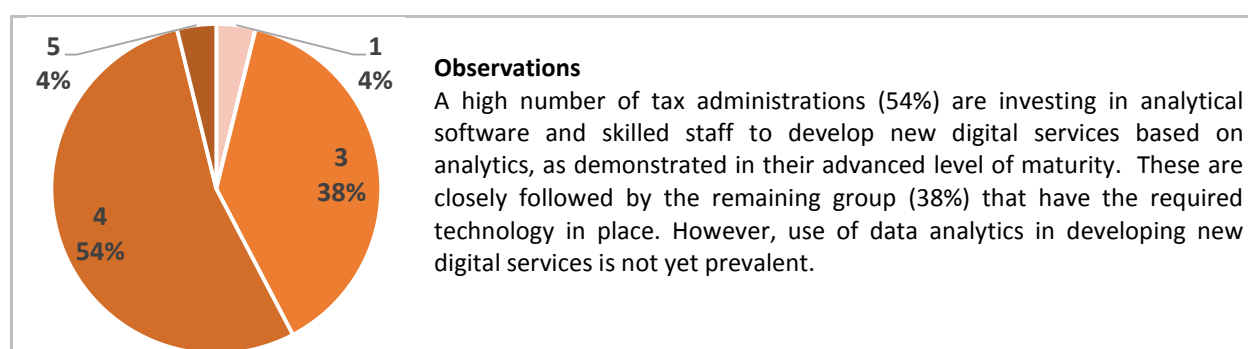
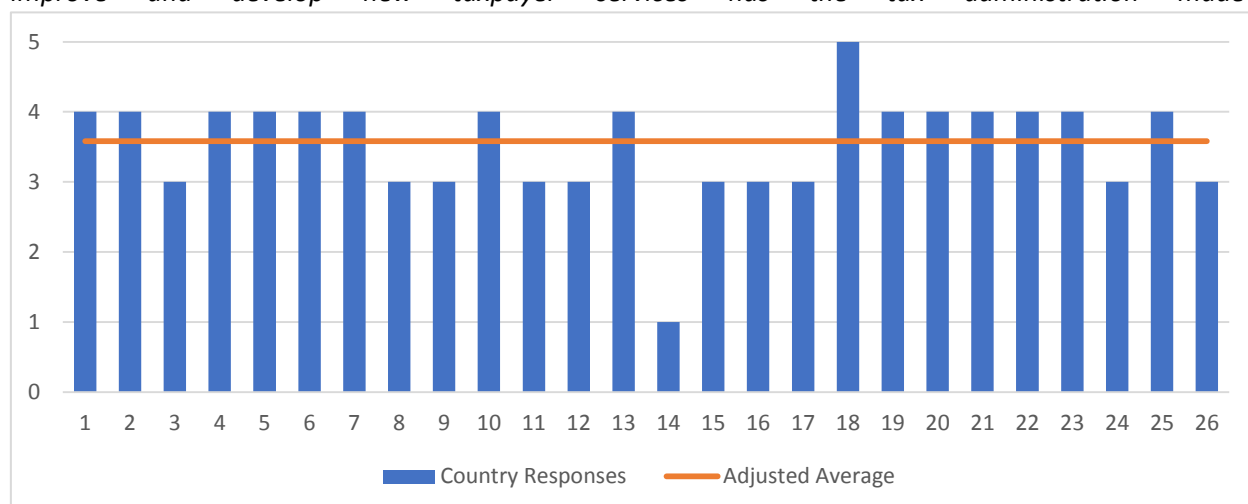
2.1. Data Sharing. *How established is a data sharing culture within the tax administration?*



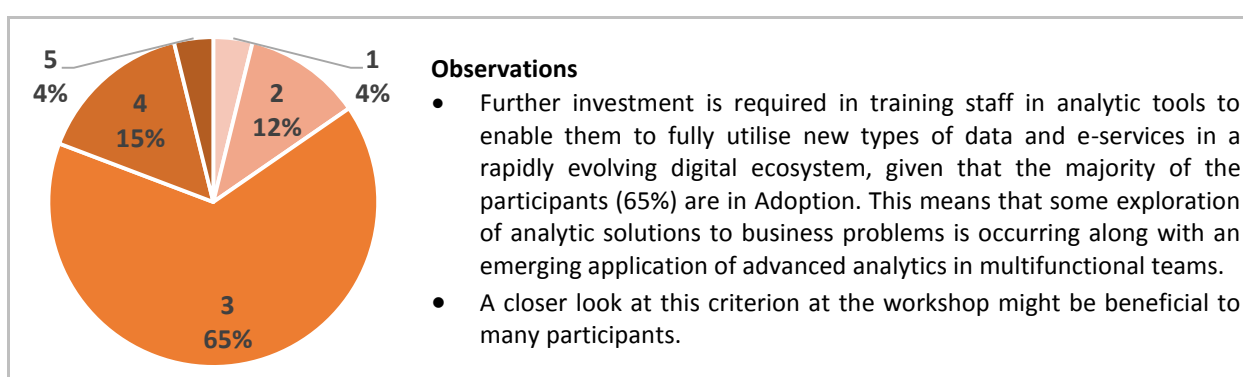
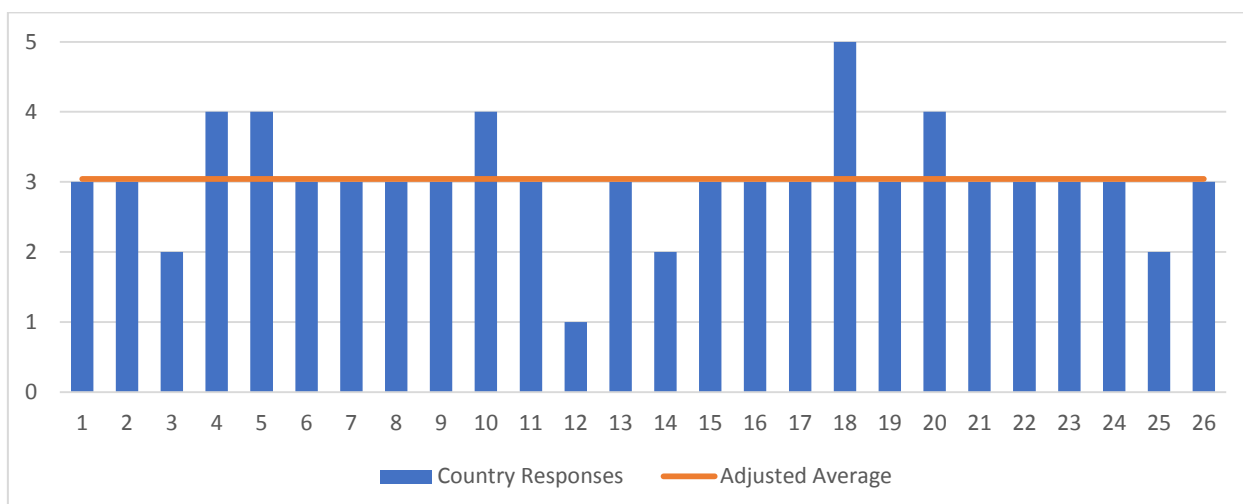
## 2.2. Data Issue Resolution. What processes are established in the tax administration to provide an efficient resolution to data issues?



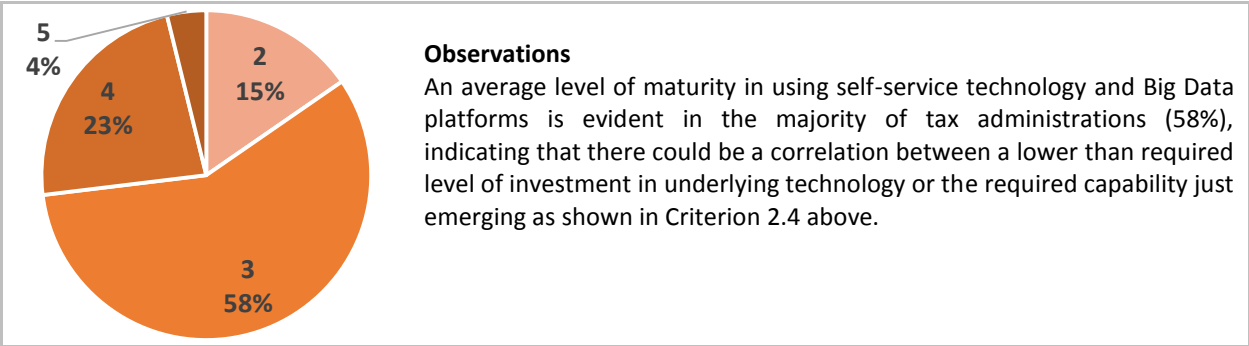
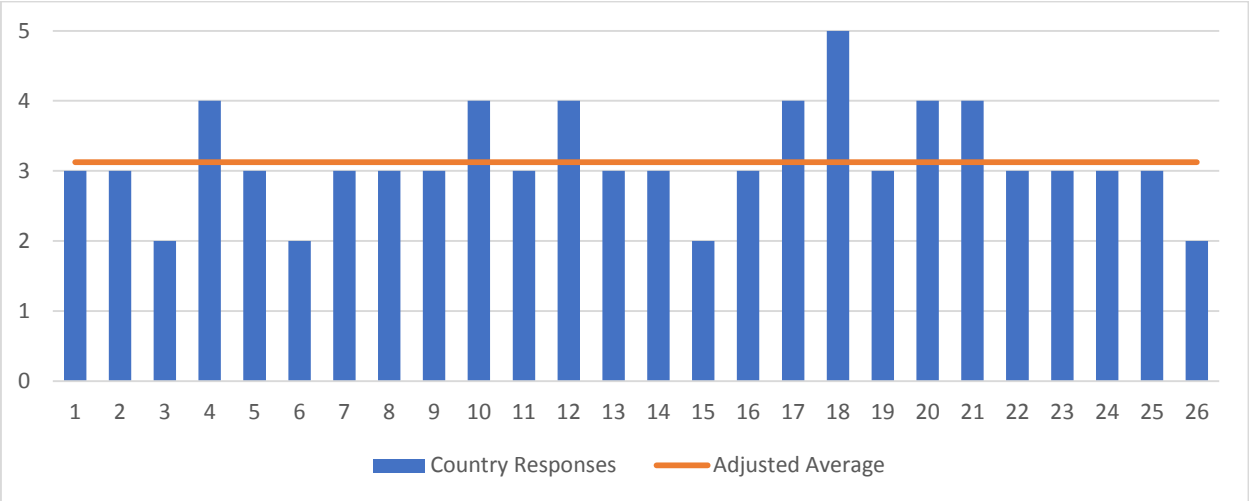
**2.3. Data Analytics.** *What investment in analytical software and skilled staff to analyse data to improve and develop new taxpayer services has the tax administration made?*



**2.4. Analytic Tools Training.** *How much has the tax administration invested in training staff to use analytic tools to support delivery of its digital vision?*



**2.5. Self Service Technology.** *How established is the tax administration’s platform to effectively provide self-service technology?*

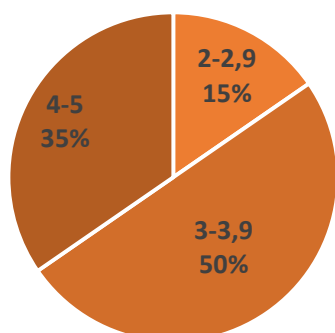
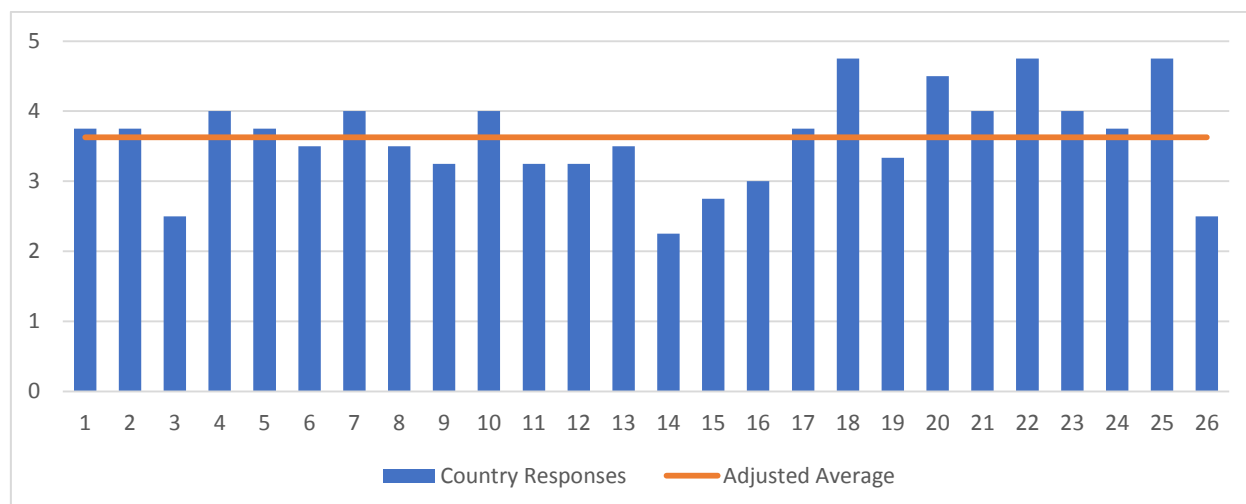




## 3. Infrastructure

This category examines the elements of IT infrastructure that are essential to transition from a transaction based to a data-driven organisation, that is able to support real to near-real time collaboration with taxpayers, improve service delivery and reduce costs.

**Y Axis Legend:** 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice.

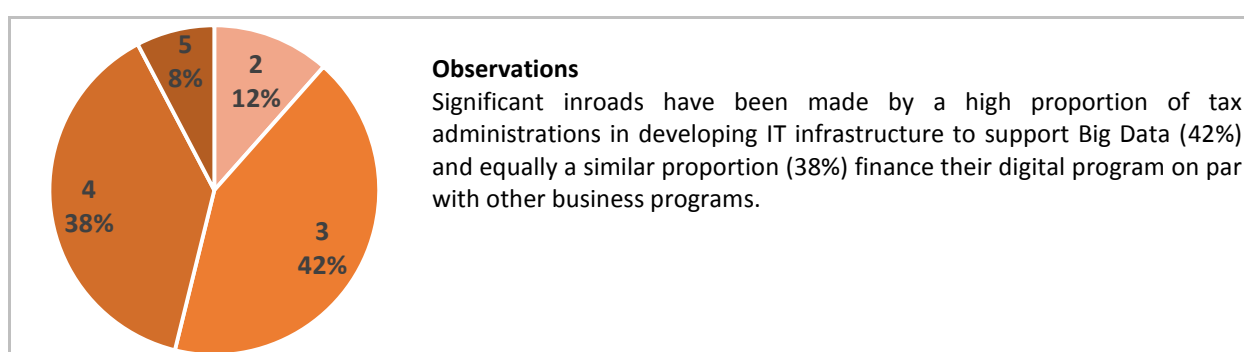
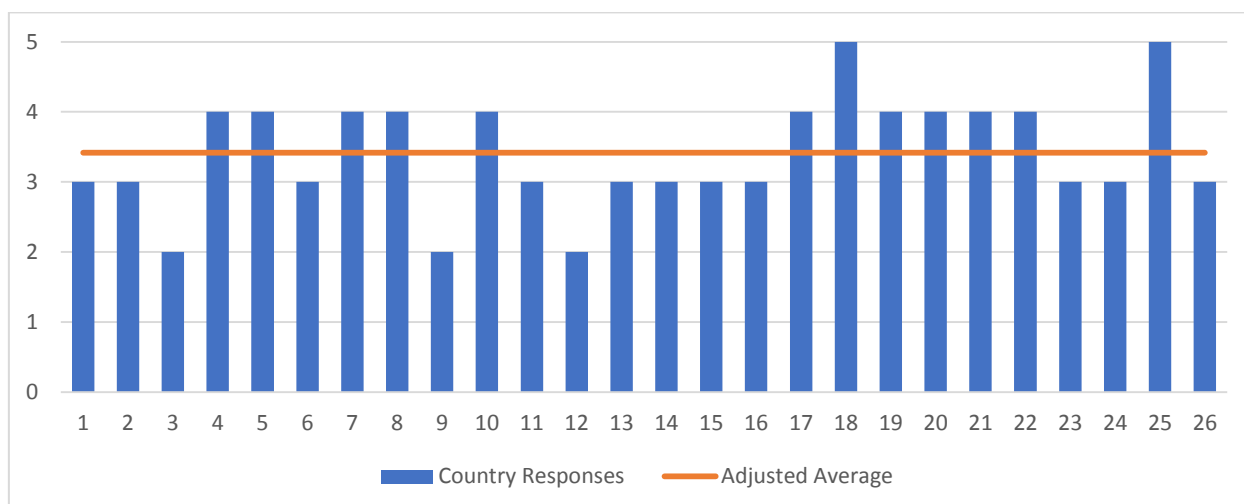


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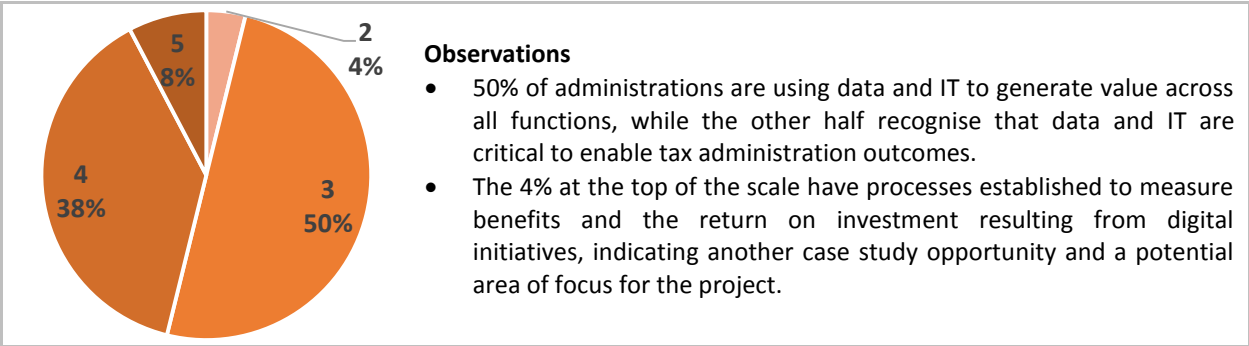
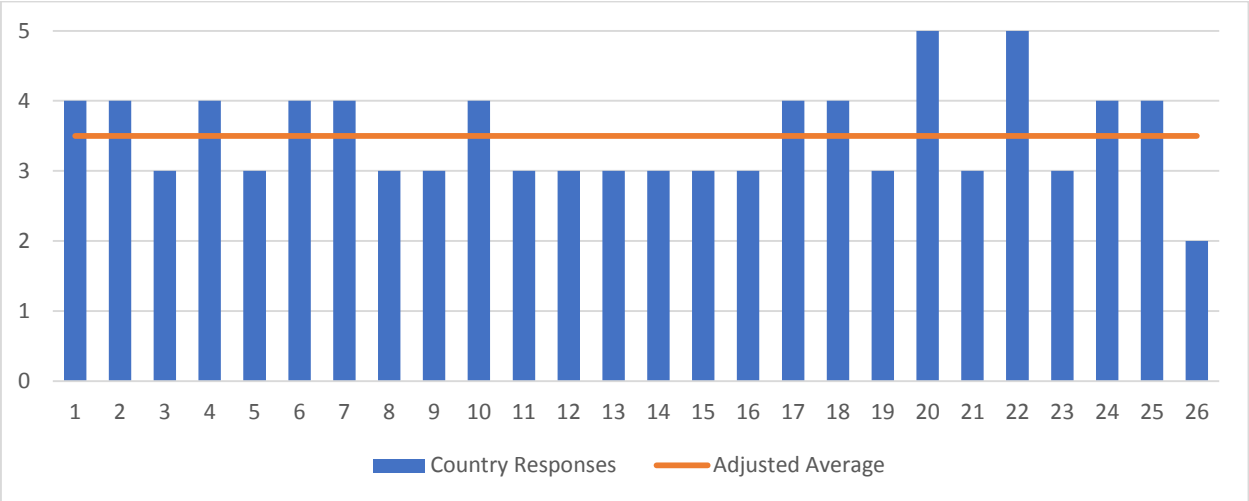
### Observations

- The majority of responses for this category are falling above or just under the adjusted average, showing Advance level of maturity due to substantial investments in IT infrastructure and good progress made in developing unified IT architecture.
- Notwithstanding the importance of IT architecture development and design in deriving business value from Big Data, the results of the self-assessment for this category should be viewed in the context of other critical aspects, such as data strategy, people and processes, given that the expected logical correlation is not evident in the assessment ratings across some of the elements.

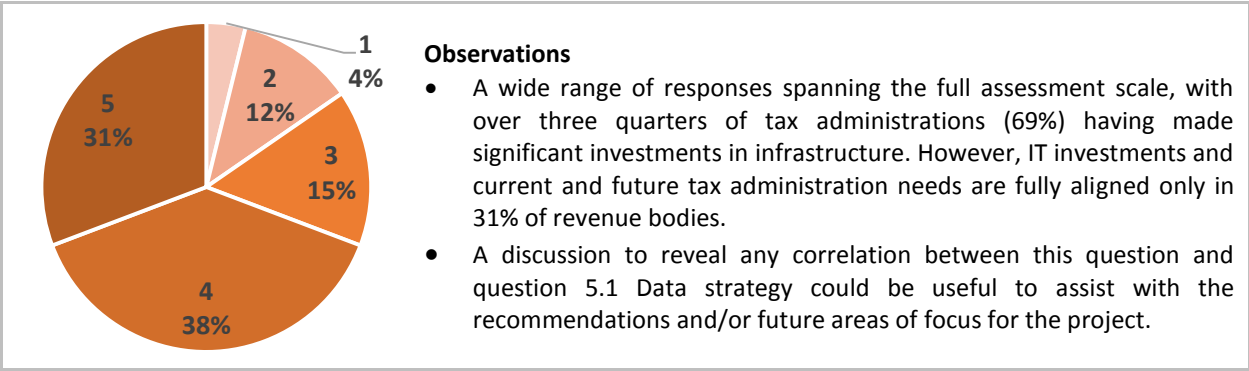
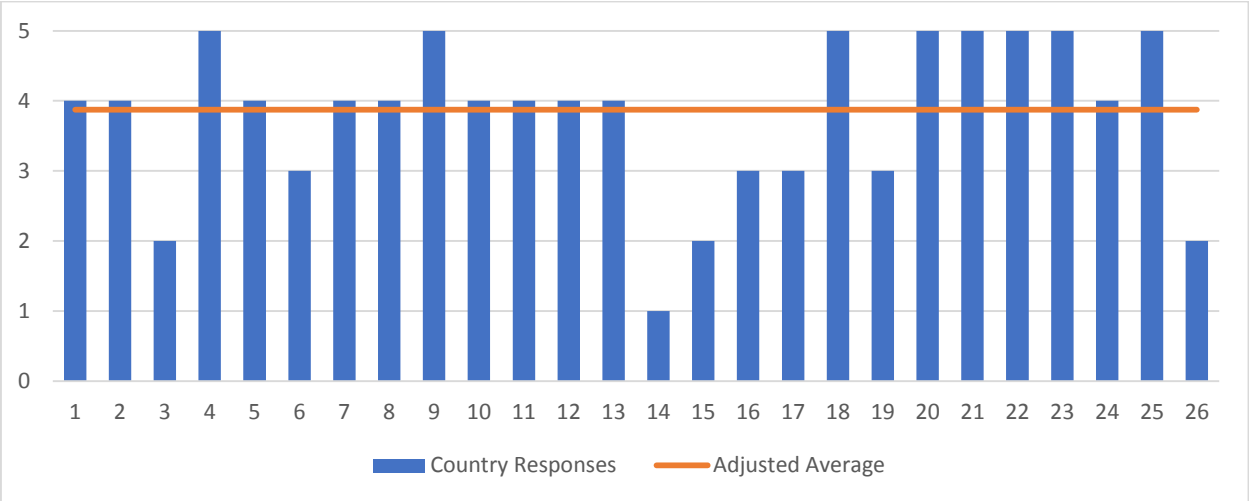
## 3.1. IT Infrastructure Development. *How much does the tax administration engage in IT infrastructure development?*



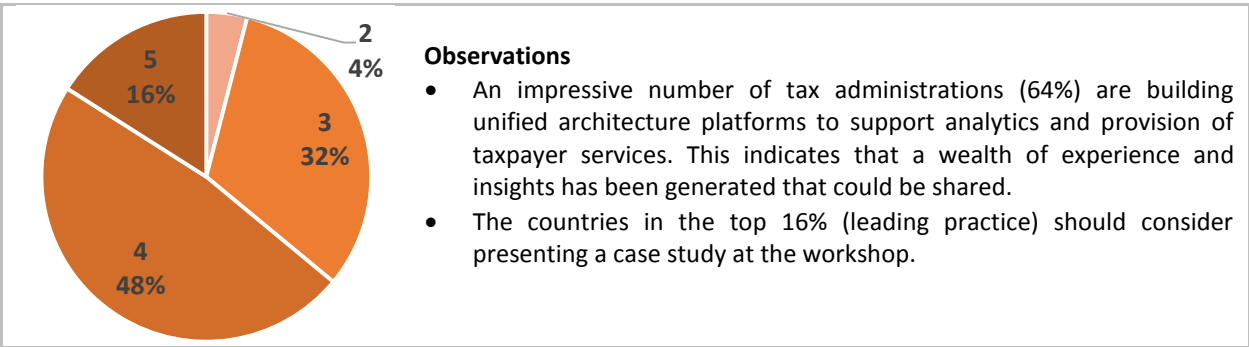
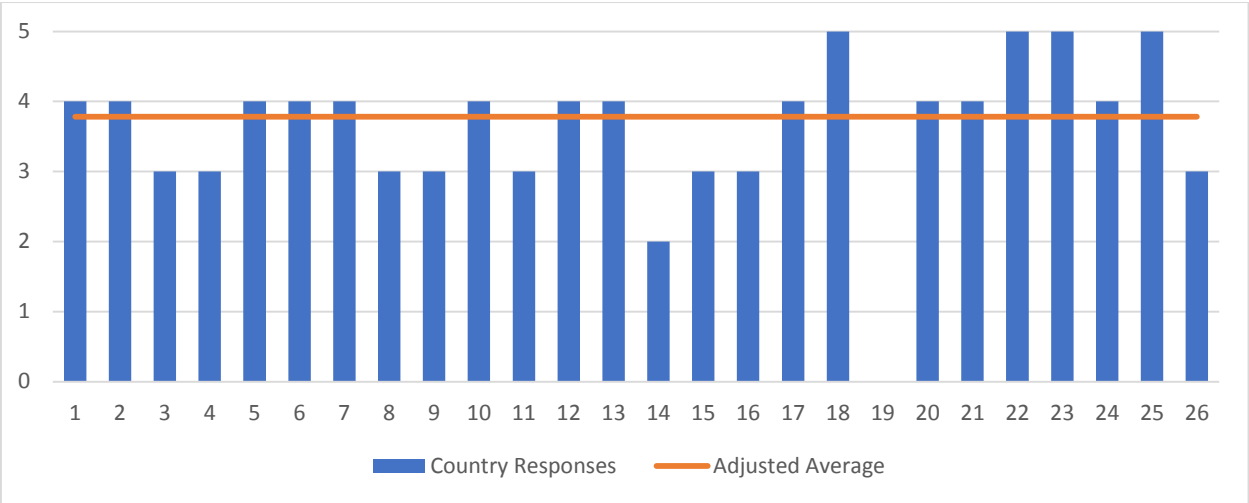
**3.2. Data & IT Value.** *How does the tax administration view IT and data generated assets that enable the tax administration to meet its digital outcomes?*



**3.3. IT Investments.** *How has the tax administration invested in IT infrastructure to support its current and future digital outcomes?*



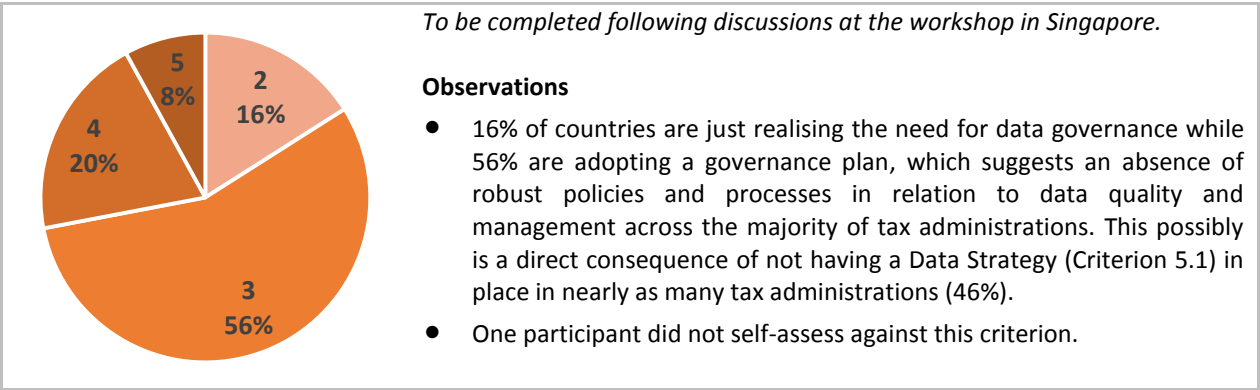
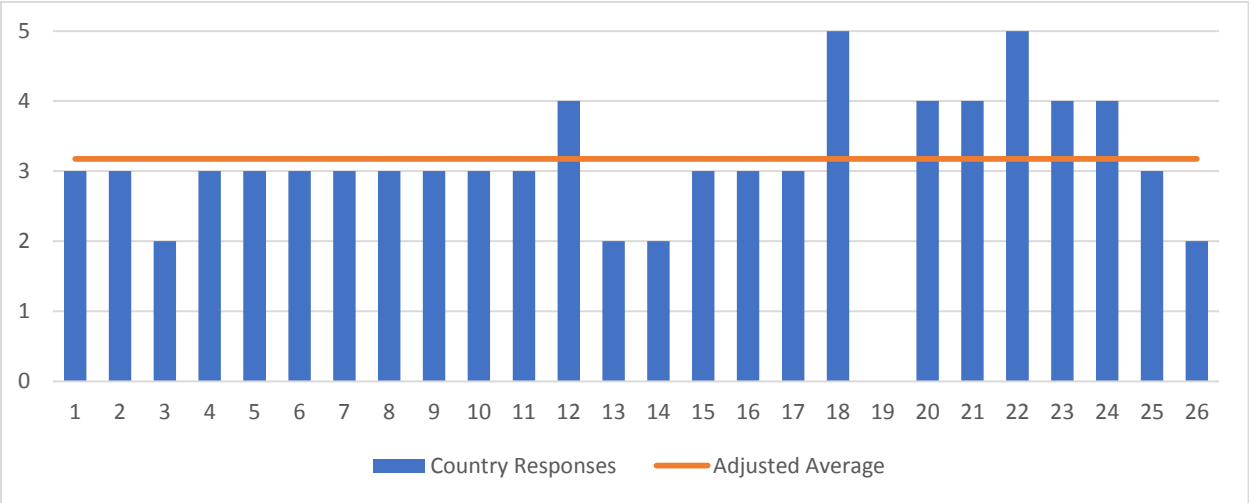
3.4. Unified IT Architecture. *How unified is the tax administration’s IT architecture?*



4. Governance

What processes and controls are in place for data management across the tax administration?

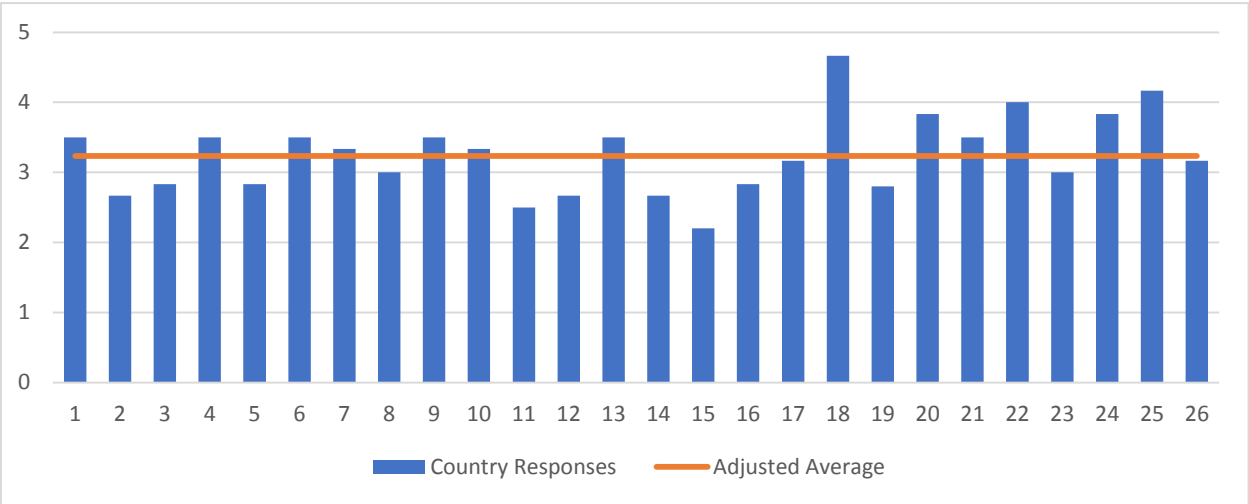
**Y Axis Legend:** 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice.



5. Data

The set of questions in the Data category help determine the level of digital maturity by looking at data quality, centralisation, acquisition and use of Big Data, and unstructured data in particular, all of which should be guided by a clear overarching data strategy.

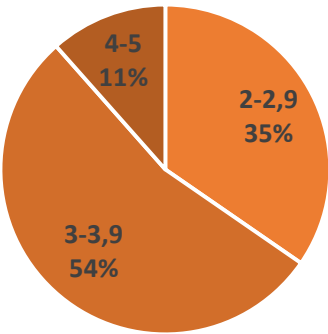
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*To be completed following discussions at the workshop in Singapore.*

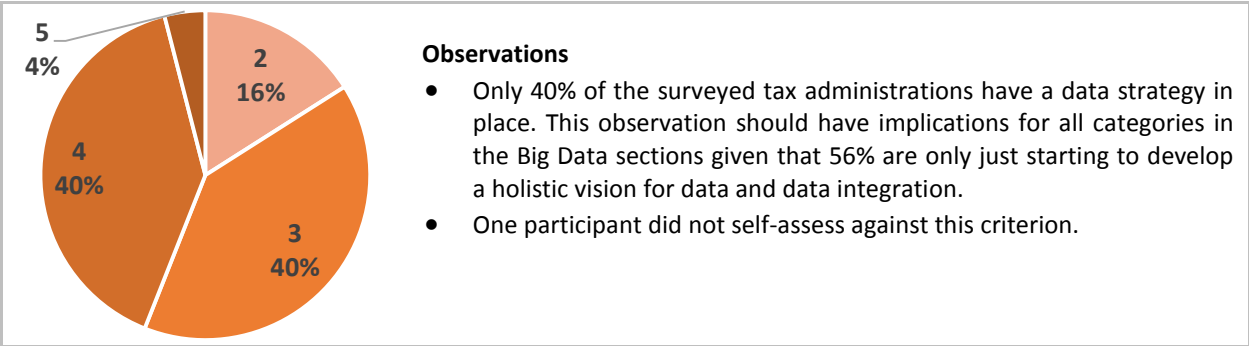
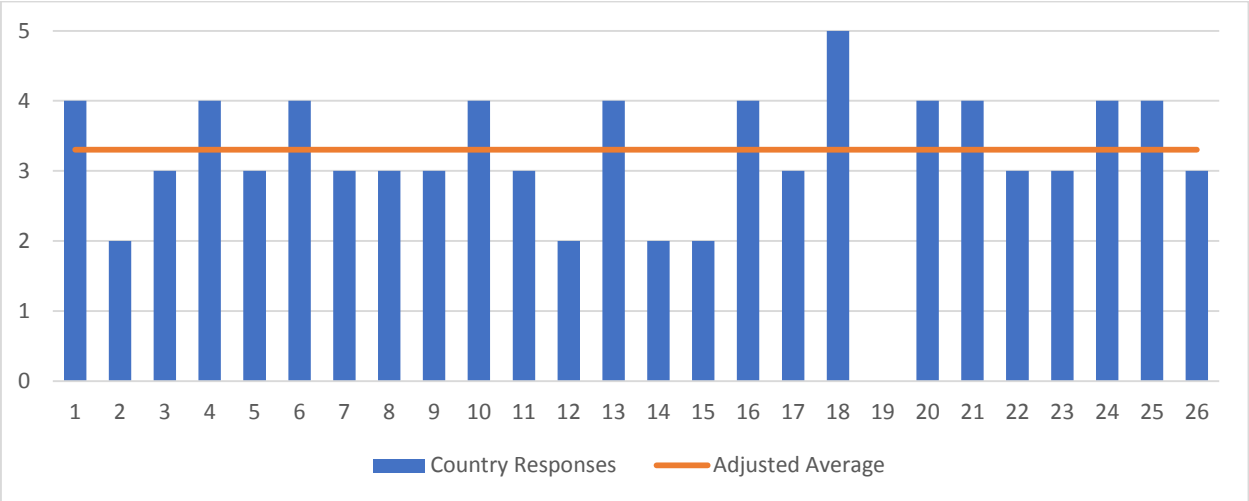
**Observations**

- A generally lower level of maturity can be observed across this category due to emerging use of multiple data acquisition channels, Big Data and unstructured data, which could be further explained by a low number of administrations having a data strategy in place.
- The need for a data strategy should not be underestimated as it will define how Big Data capability will be developed and utilised to achieve tax administration strategic objectives, otherwise it may result in administration’s inability to reap the benefits from their newly created data resources and IT investments.
- Given a higher level of maturity in the IT infrastructure category, a discussion on the relationship between the Data and IT infrastructure categories could be worthwhile to determine whether the undesirable outcome described is indeed a reality being faced by any of the tax administrations that do not have a data strategy in place. If this finding is validated, it will assist the project to formulate recommendations that will help administrations to improve their level of maturity for the Data category.

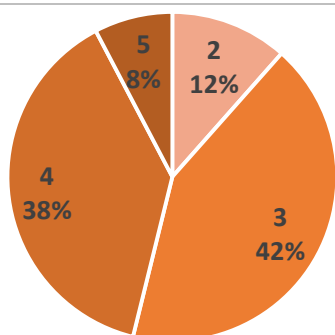
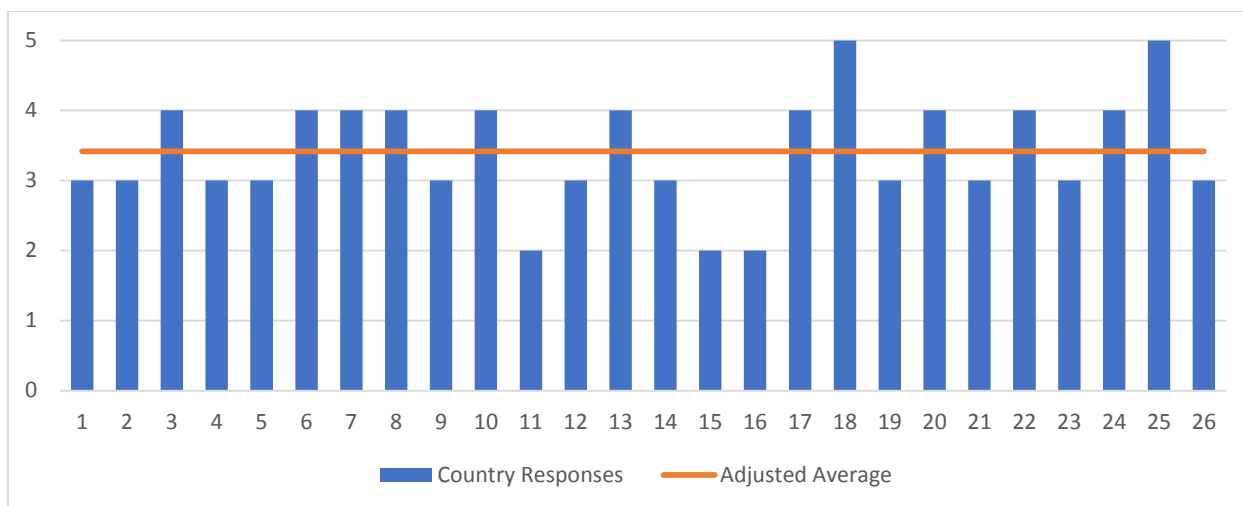




5.1. Data Strategy. What data strategy does the tax administration have in place that covers multiple data sources, along with different data types?



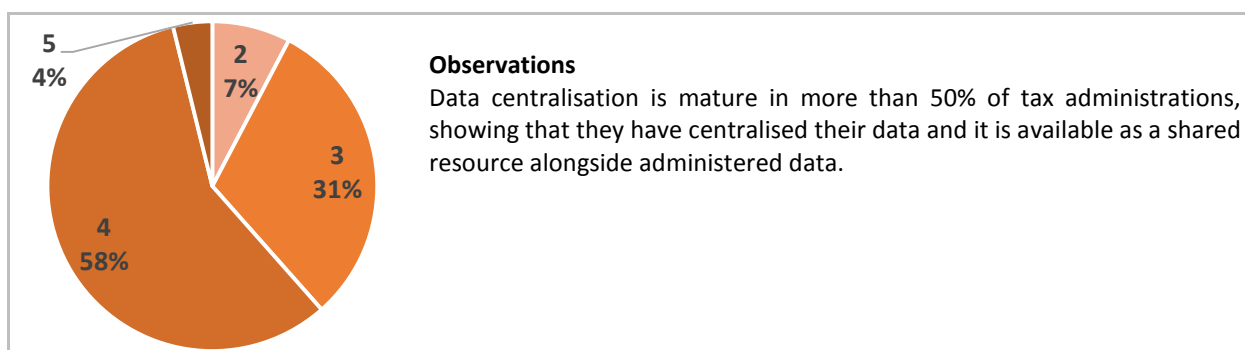
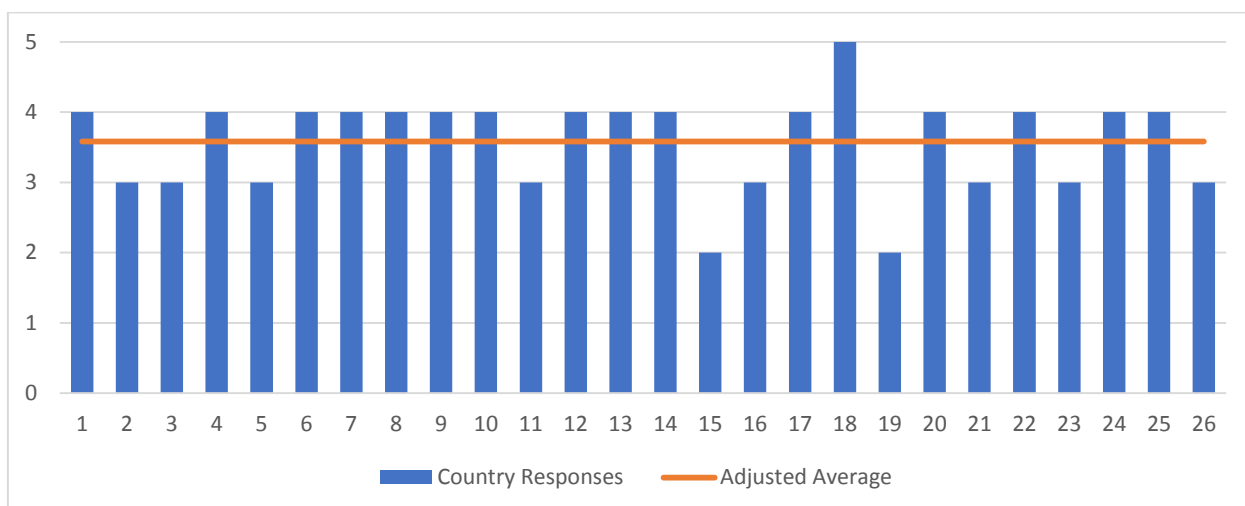
## 5.2. Data Quality. How high is the quality of data in the tax administration?



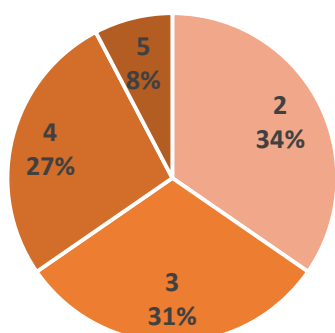
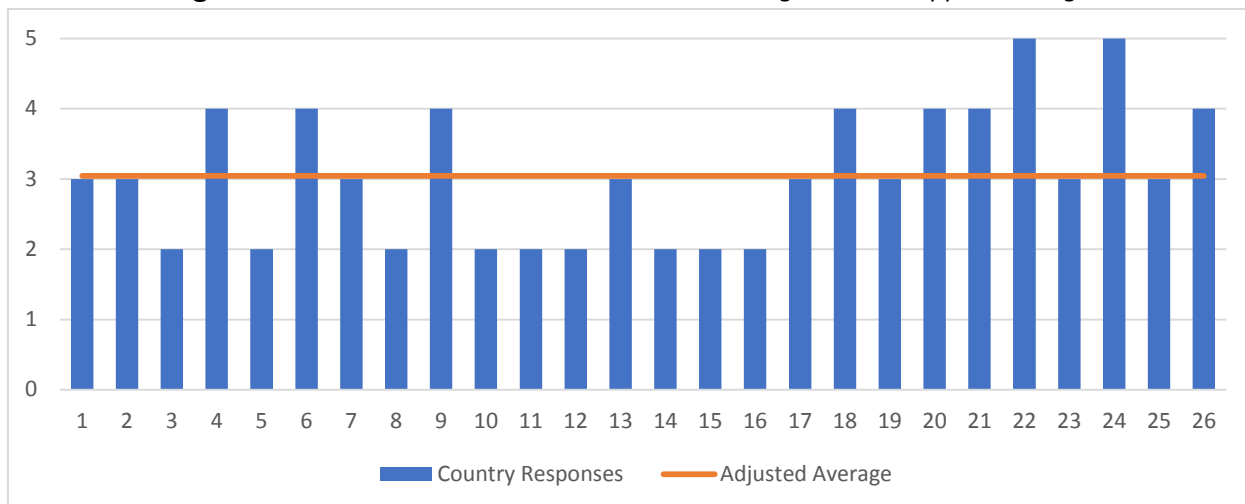
### Observations

- Equal proportions of the participants are investing significant resources to improve data quality (42%) and using available and new data for analytic and e-services delivery purposes (38%), with 8% innovating and using data to draw insights that create the environment for better compliance and service delivery.
- This area could be a good case study opportunity to hear from the countries that scored themselves as Leading Practice.

**5.3. Data Centralisation.** *What shared data resources does the tax administration have in place to provide a consistent and consolidated view of data?*



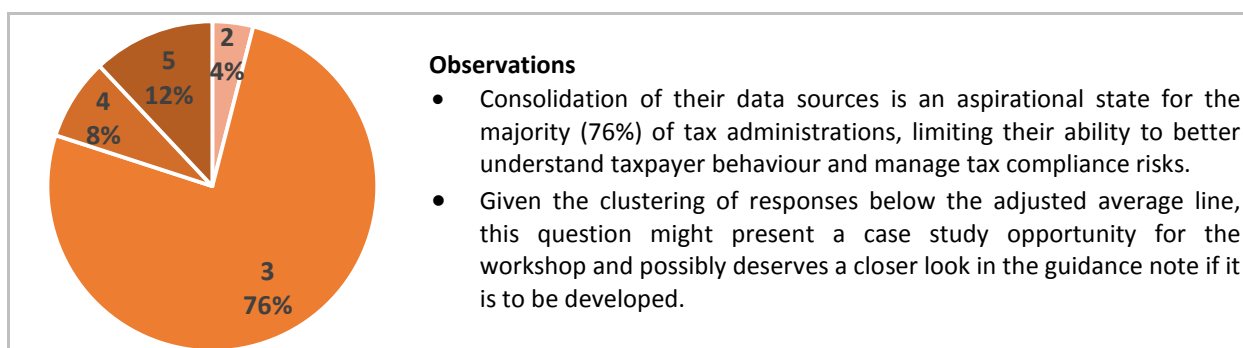
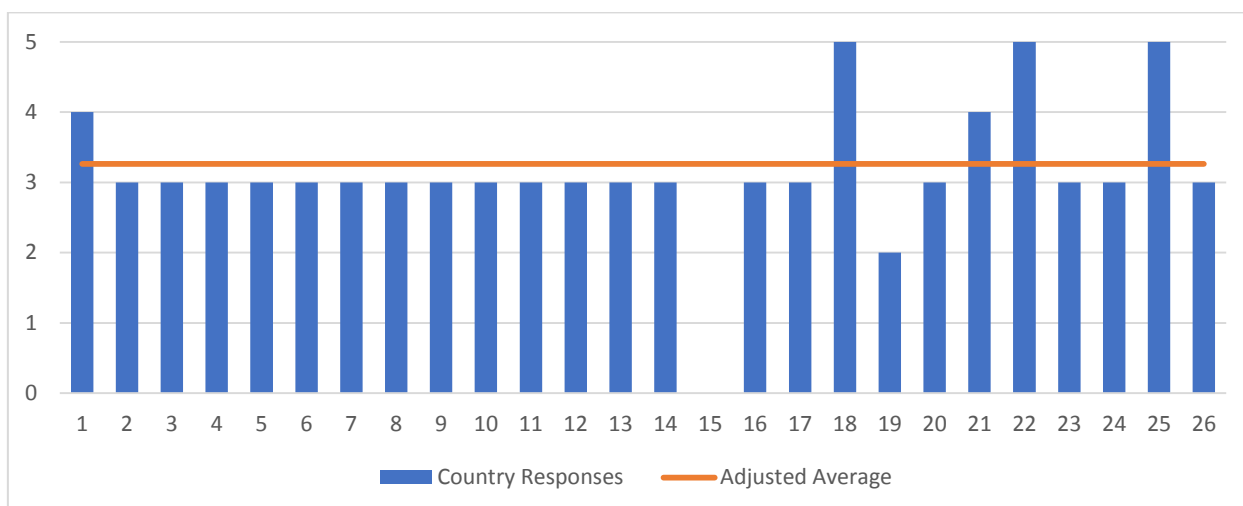
#### 5.4. Use of Big Data. How does the tax administration use Big Data to support its digital outcomes?



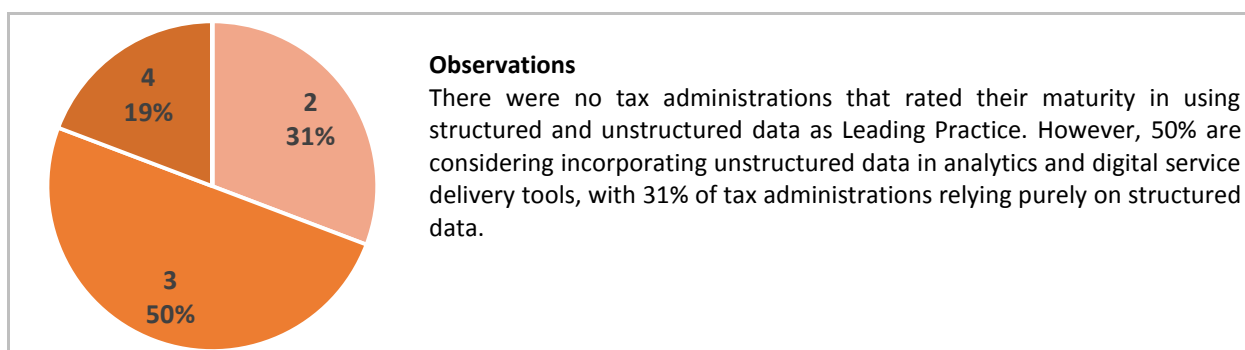
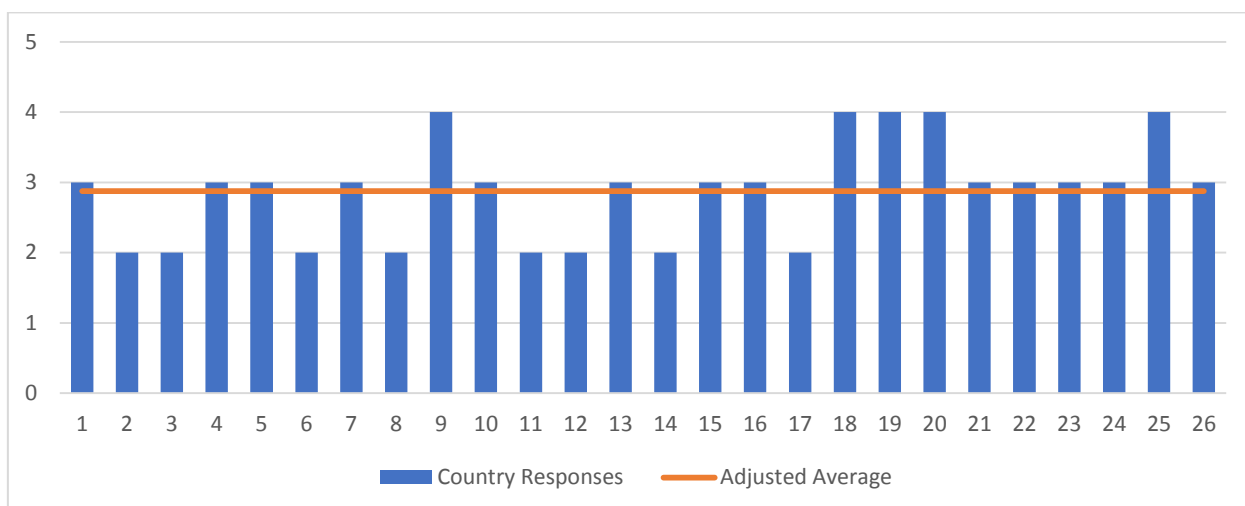
#### Observations

31% of the participants are starting to rely on Big Data to analyse and manage tax compliance risks and deliver customer centric services, while 27% are using Big Data and advanced analytics as a backbone of their business and moving taxation to the point of transaction or real to near real-time assessments and service delivery (8%), including support for pre-filled returns or no-return approaches. The tax administrations that have already realised the benefits of Big Data could share their valuable and practical insights via a case study.

**5.5. Multiple Channels of Data Acquisition.** *How does the tax administration use data from different channels to improve and develop new services and understand taxpayer compliance?*



**5.6. Structured and Unstructured Data.** *How does the tax administration use structured and unstructured data?*



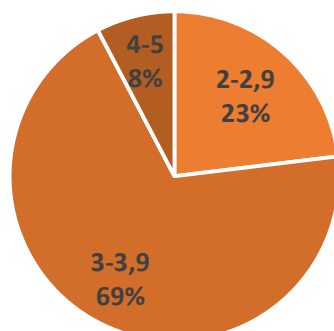
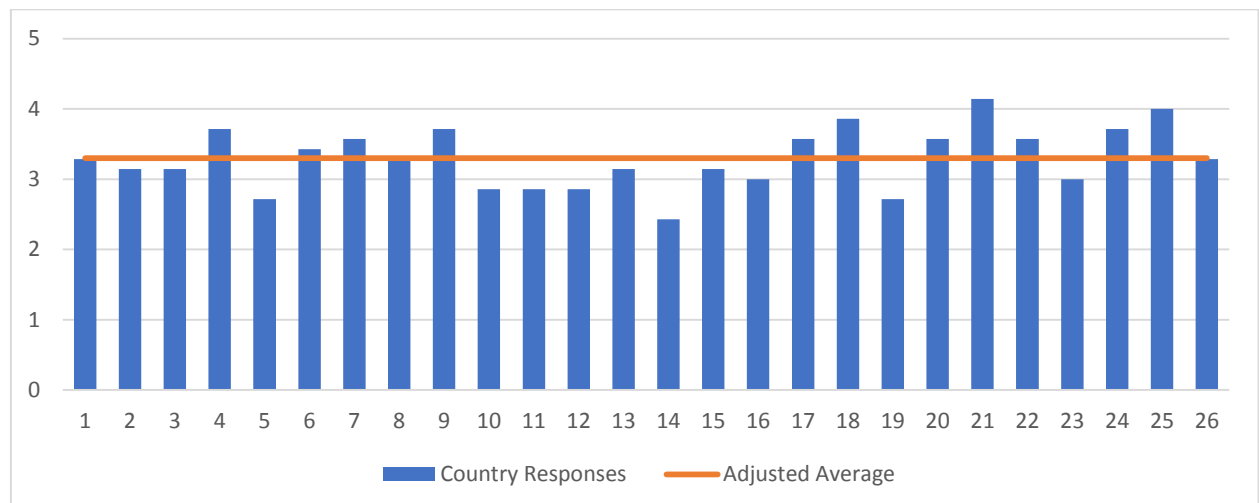


## Observations by Category & Question – Portals & Natural Systems

### 1. Online Tools and Services

This category assesses digital maturity of the online tools and services offered by tax administrations by looking at availability of online information, security of digital transactions, segmentation and personalisation in delivering end to end digital services.

**Y Axis Legend:** 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice

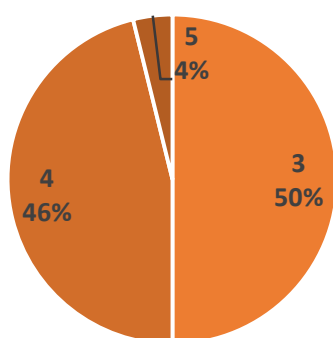
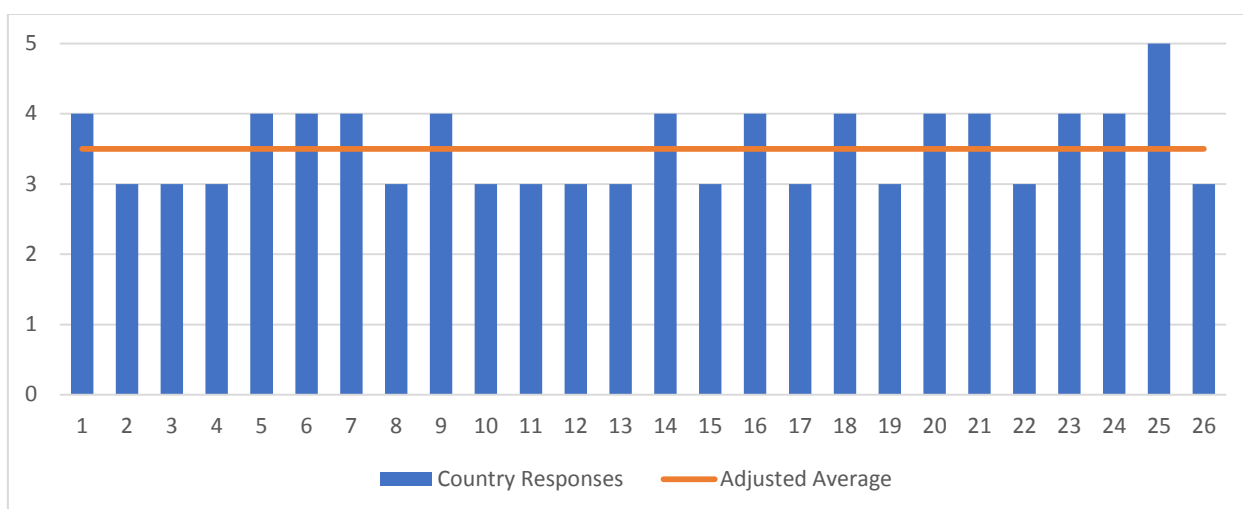


*To be completed following discussions at the workshop in Singapore.*

#### Observations

- A higher level of maturity by the majority can be noted due to tax administrations' online delivery of information and secure end to end transactions. However, multi-dimensional segmentation and personalisation that are required to deliver seamless, customised services from any device anytime are only evident in some responses.
- A determination on whether these could be potential areas of focus for the project, could inform future direction of the Model, particularly from a Big Data integration and use of advanced analytics perspectives, and channel shift strategies.

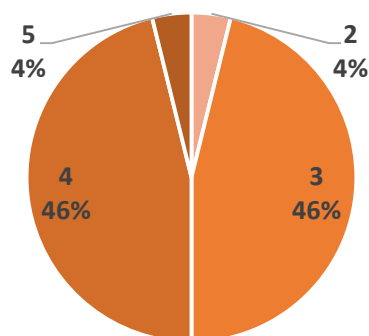
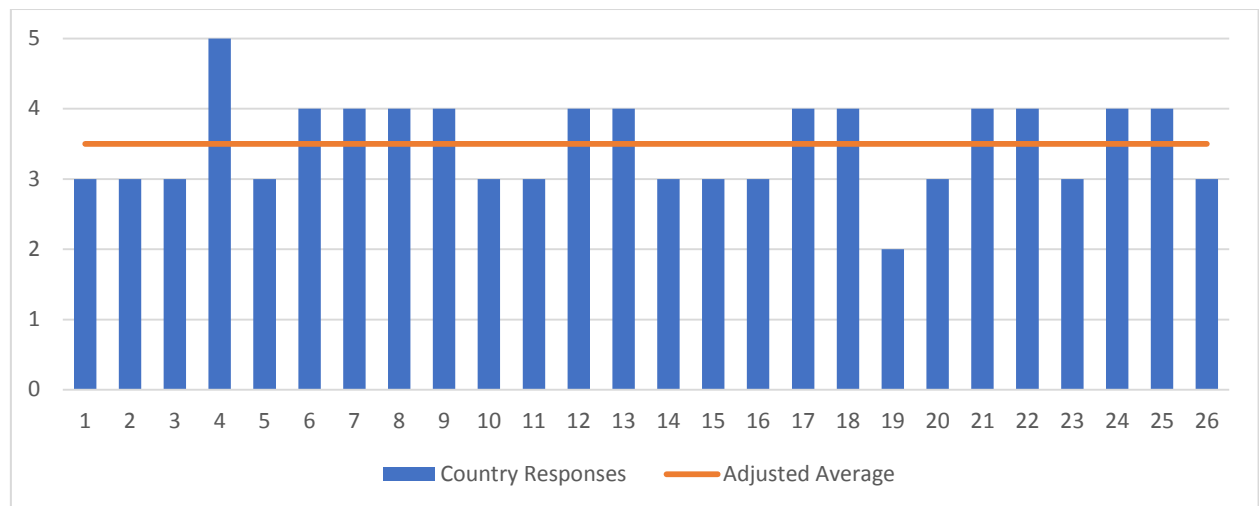
## 1.1. Information Available. *How easy to access and use is the tax administration's website?*



### Observations

The ratings for this criterion show that all administrations have a website presence with up-to-date information available to their taxpayers. However, 50% have acknowledged that the information is hard to find. Notably, one tax administration is leading the way, with a customer focused approach and provision of tailored information to their external and internal audiences, which undoubtedly represents a good case study opportunity.

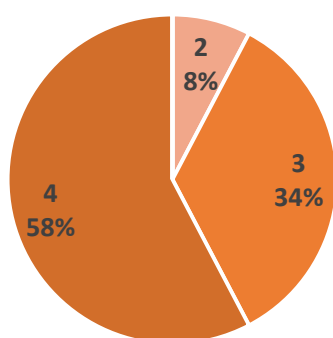
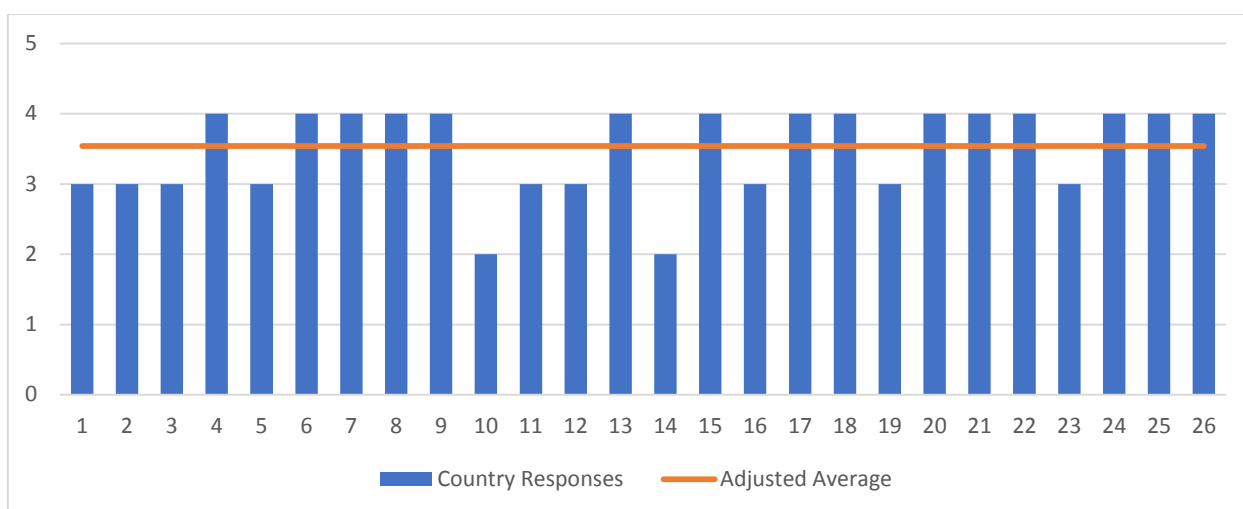
## 1.2. End-to-end Digital Services. *How do taxpayers transact digitally with the tax administration?*



### Observations

A large proportion of tax administration are transacting with their taxpayers digitally, with services integrated into a portal solution with a single entry point. Almost as many administrations have most of the two-way interactions available digitally end-to-end. While seamless integration into taxpayers' online environment is attainable for the majority of tax administrations given their current state of maturity, the revenue body in the Emerging phase could benefit from their learnings

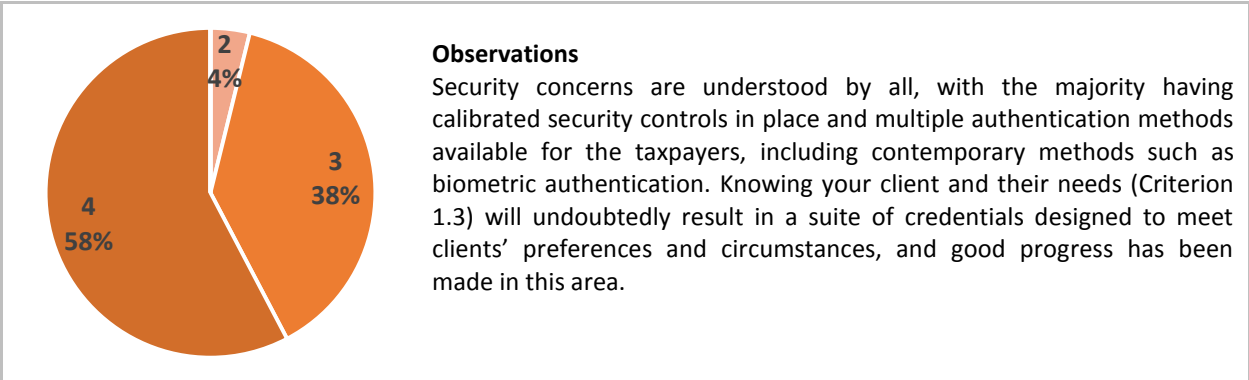
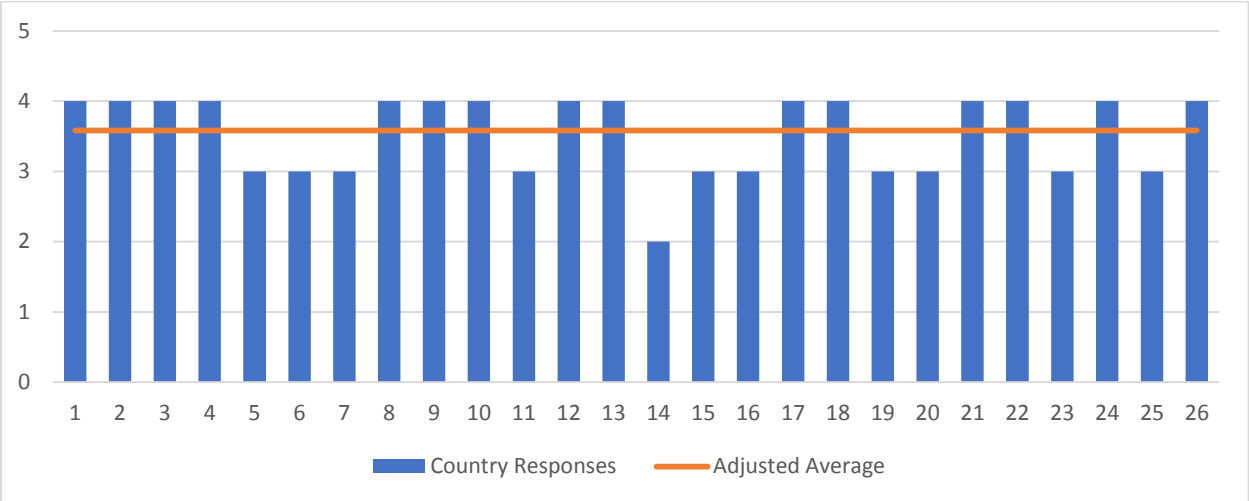
### 1.3. Digital Services. To what extent are the tax administration services user-centred?



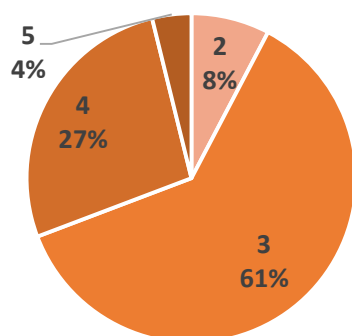
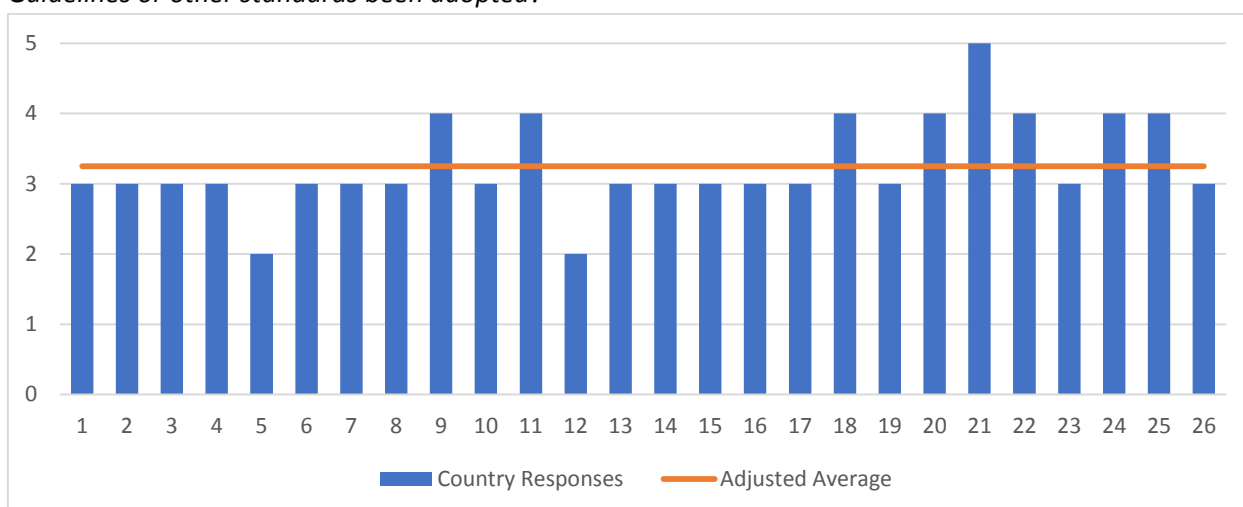
#### Observations

In total, the number of ratings across Adoption and Advanced stages is the same for Criteria 1.2 and 1.3. However, the dispersal across the stages of maturity is different in the provision of user-centered services, which indicates that while a lower number of tax administrations have end-to-end services available (46% as per 1.2), more administrations (58% as per 1.3.) are considering taxpayer experience as their starting point in developing end-to-end digital services.

**1.4. Authentication.** *How advanced is the tax administration’s secure online environment requiring user verification?*



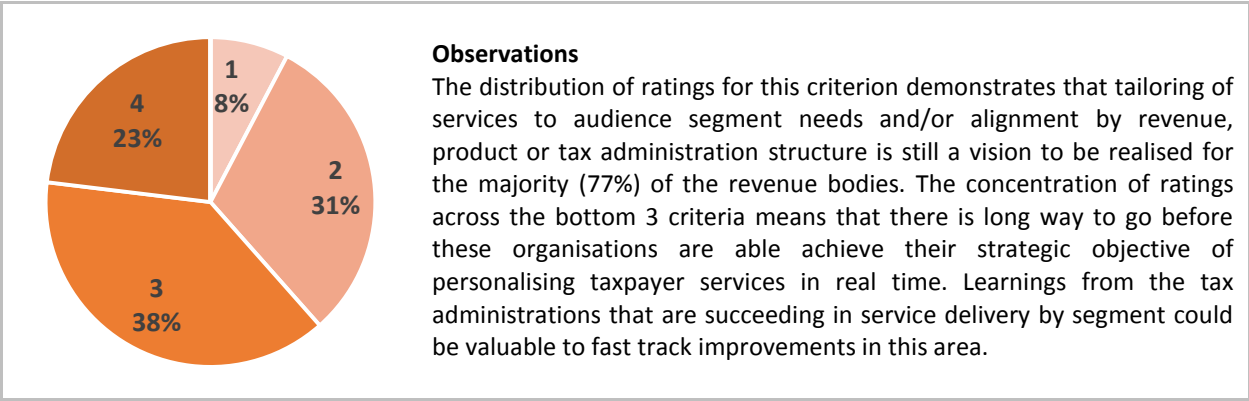
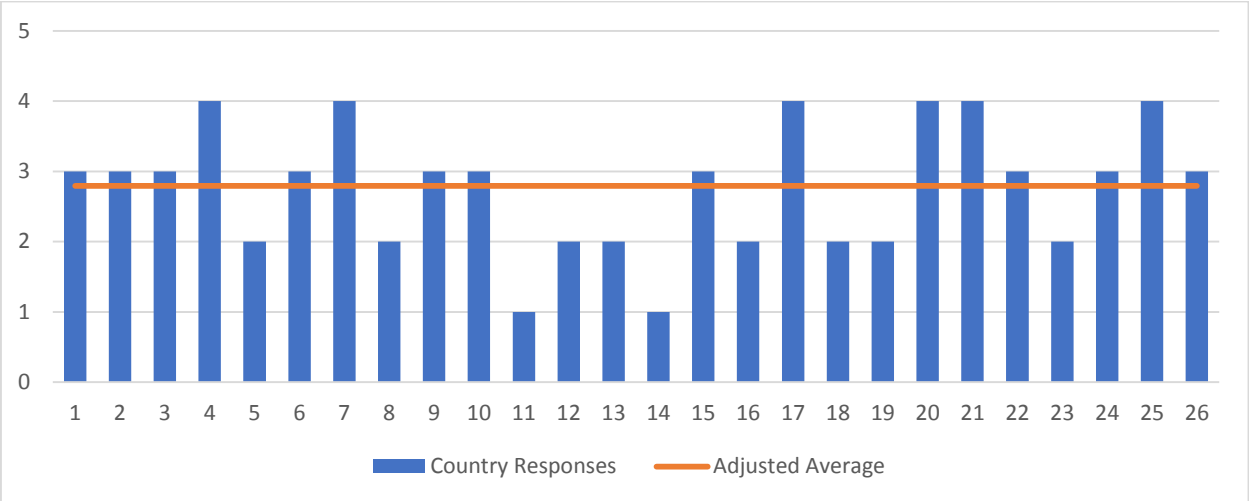
**1.5. Accessibility and Availability.** *To what extent are taxpayers able to access tax administration services (informational and transactional) from any device in real-time? Have Web Content Accessibility Guidelines or other standards been adopted?*



#### Observations

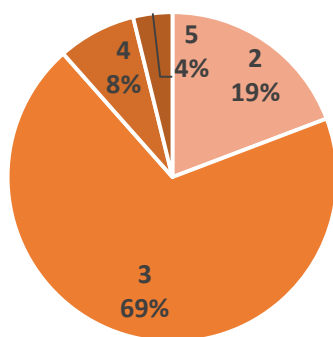
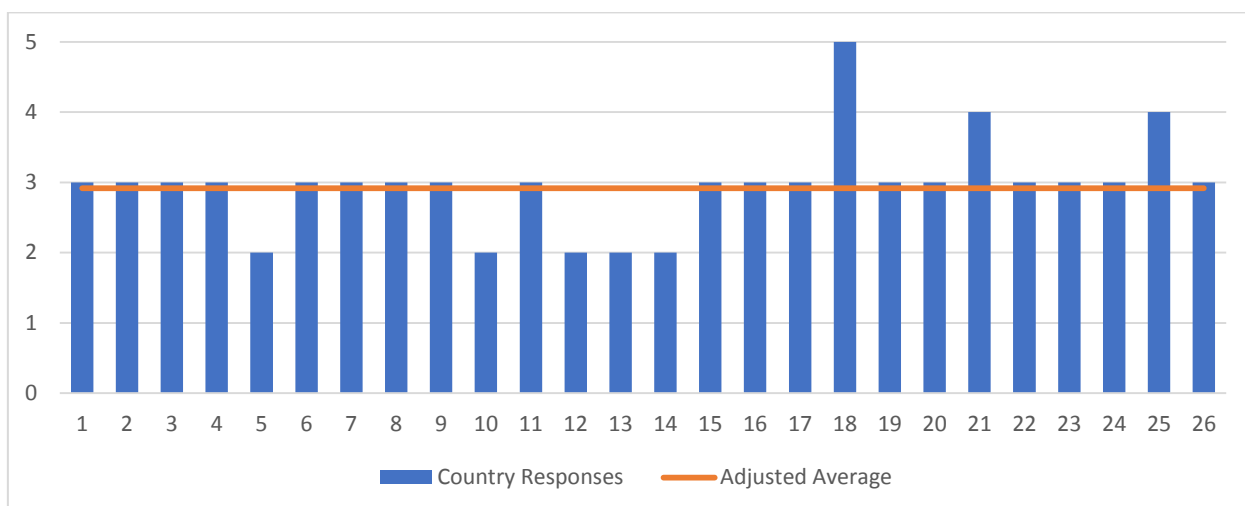
This area may require closer attention given that over two thirds of the tax administrations surveyed have limited services optimised for different devices (69%) and significant improvements required to their service to make them compliant with the Web Content Accessibility Guidelines, particularly considering that while 100% have a web presence and 69% are still needing to address accessibility issues.

**1.6. Service Delivery by Segment.** *How are services tailored to audience segment needs, or are they aligned by revenue, product or the tax administration’s structure?*





**1.7. Level of Personalisation.** *How does the tax administration use personalised data to enhance electronic interaction with taxpayers?*



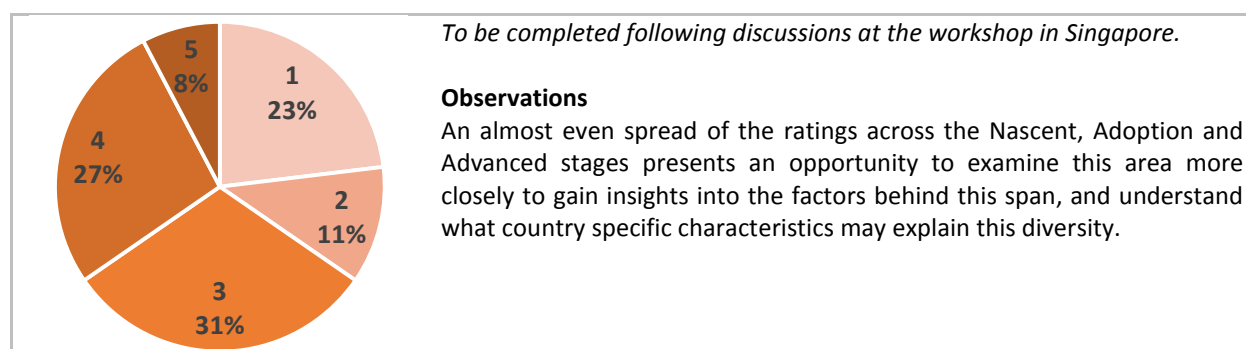
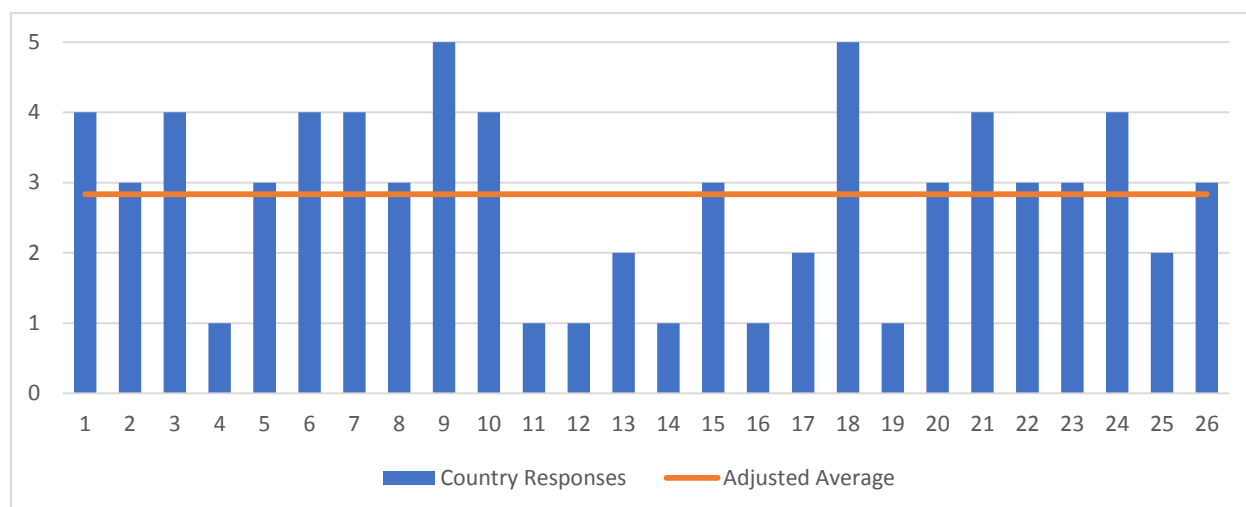
**Observations**

The availability of basic preference options in account inquiries, e-filing and e-payment services, including pre-filling of data, characterise the level of maturity of 69% of the revenue bodies, with 19% still having manual steps present in their e-services. An apt positioning of their digital programs in the context of strategic objectives and becoming attuned to the rapidly involving digital eco-system is critical to enable tax administrations to make a leap in personalising data. Digital interactions with tax administration should deliver the same level of choice and control they have when consuming other services.

## 2. Whole-of-government Single Entry Point

*How does the tax administration entry point integrate with other government services?*

**Y Axis Legend:** 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice.



*To be completed following discussions at the workshop in Singapore.*

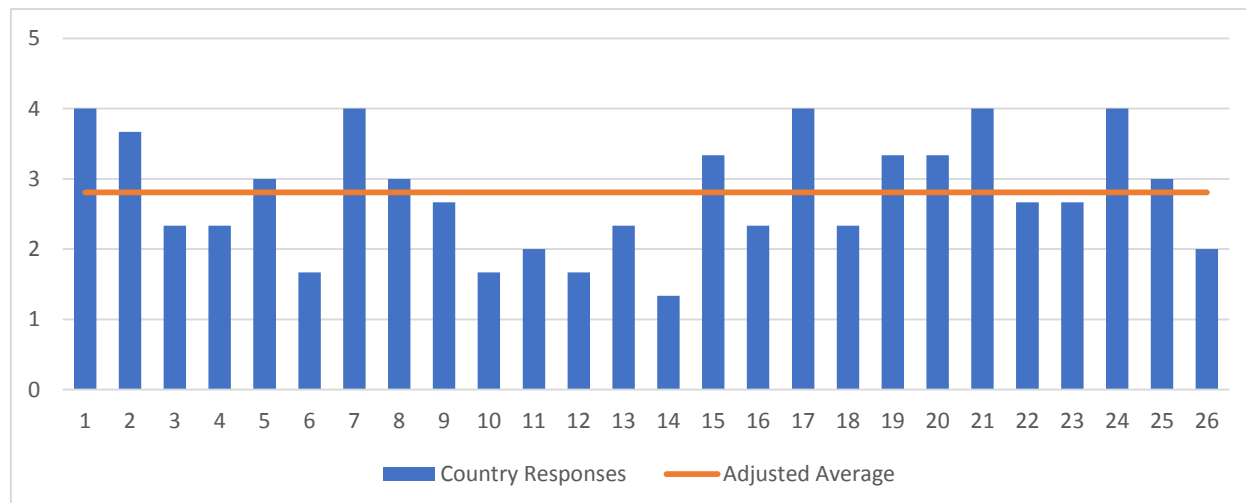
### Observations

An almost even spread of the ratings across the Nascent, Adoption and Advanced stages presents an opportunity to examine this area more closely to gain insights into the factors behind this span, and understand what country specific characteristics may explain this diversity.

## 3. Engagement

This category looks at how mature tax administrations are in co-designing their products with their users and third parties, including co-production and co-delivery of tax information and services in taxpayers' natural systems.

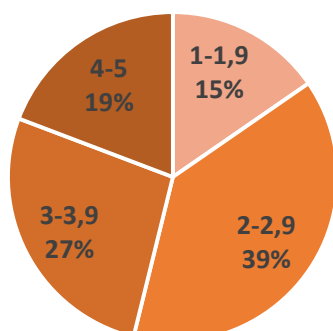
**Y Axis Legend:** 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice.



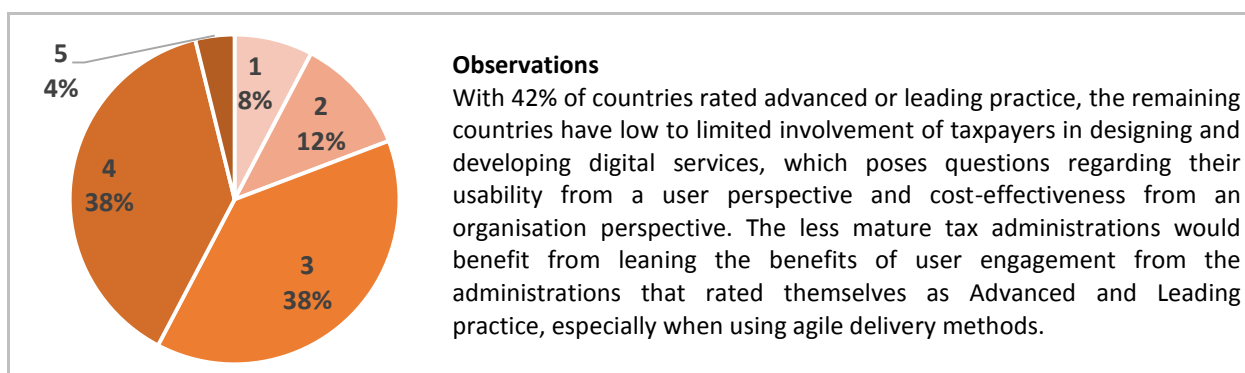
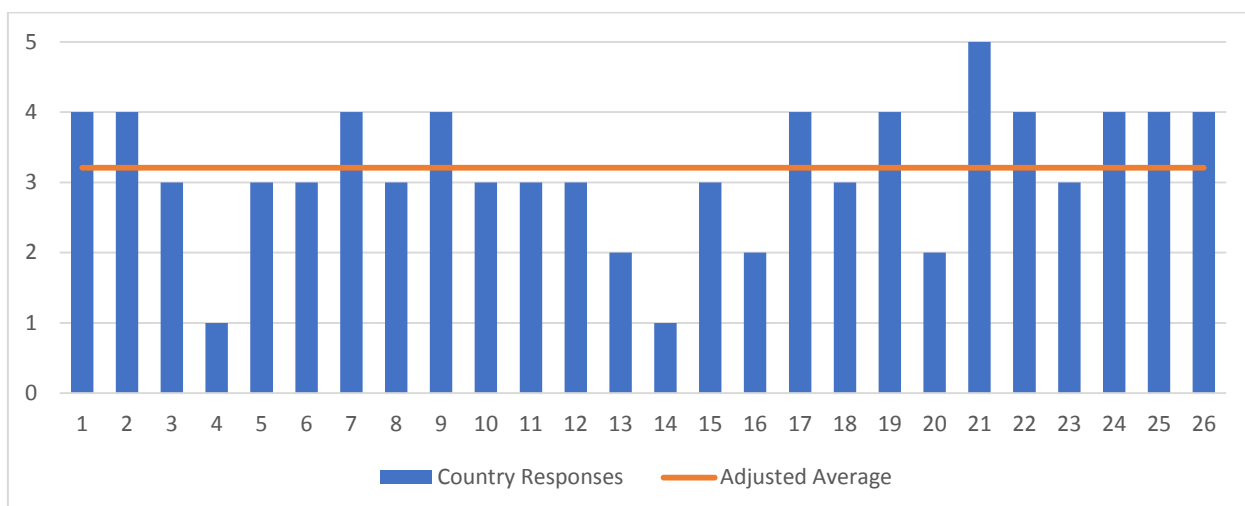
*To be completed following discussions at the workshop in Singapore.*

### Observations

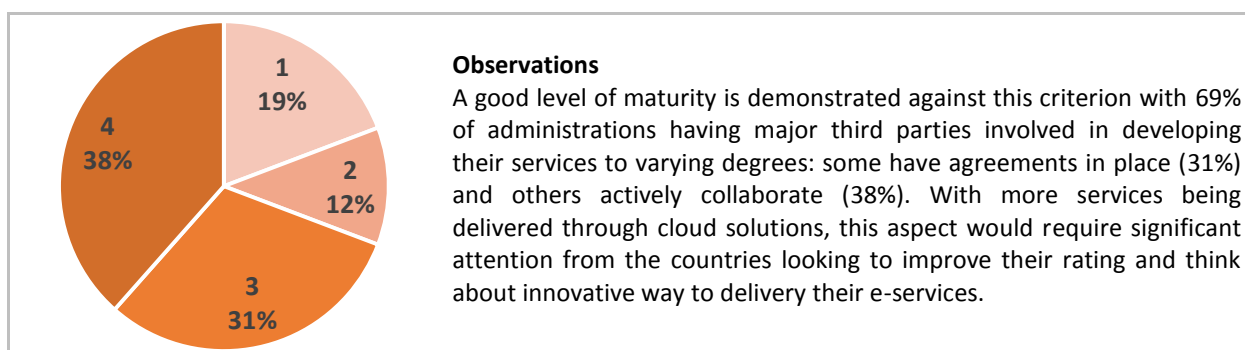
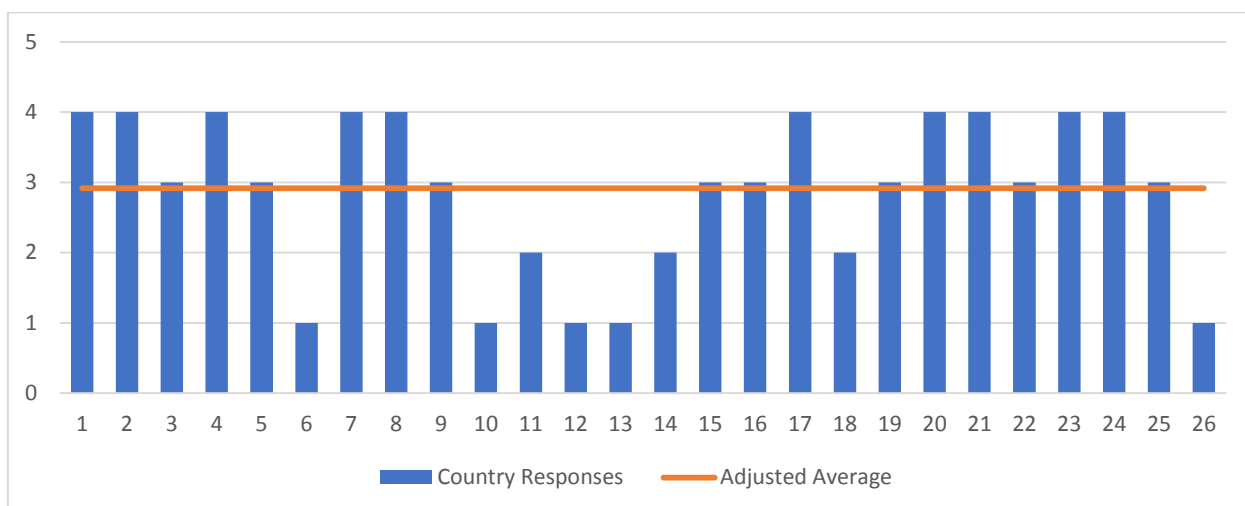
- A relatively even spread of the ratings across the Nascent, Adoption and Advanced stages presents an opportunity to examine this area more closely to gain insights into the factors behind this span.
- Working in partnership with 3<sup>rd</sup> parties and integration of tax services and information with natural systems signify a high level of digital maturity that is underpinned by a vastly different service delivery model. This could explain the level of immaturity reported by many tax administrations, however a low level of maturity in taxpayer collaboration signals a missed opportunity by many revenue bodies. With 19% leading the way a case study on this topic could be beneficial for the countries in the Emerging and Adoption phases to boost the relationship with their users.



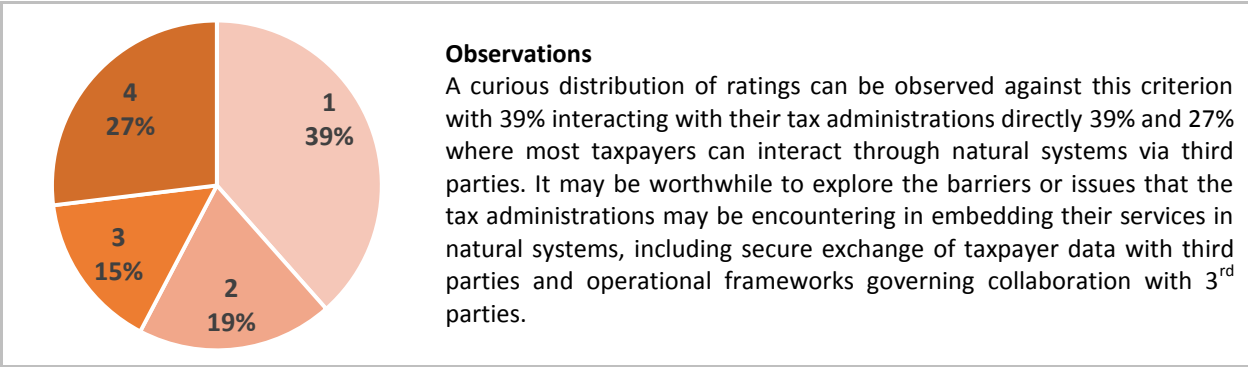
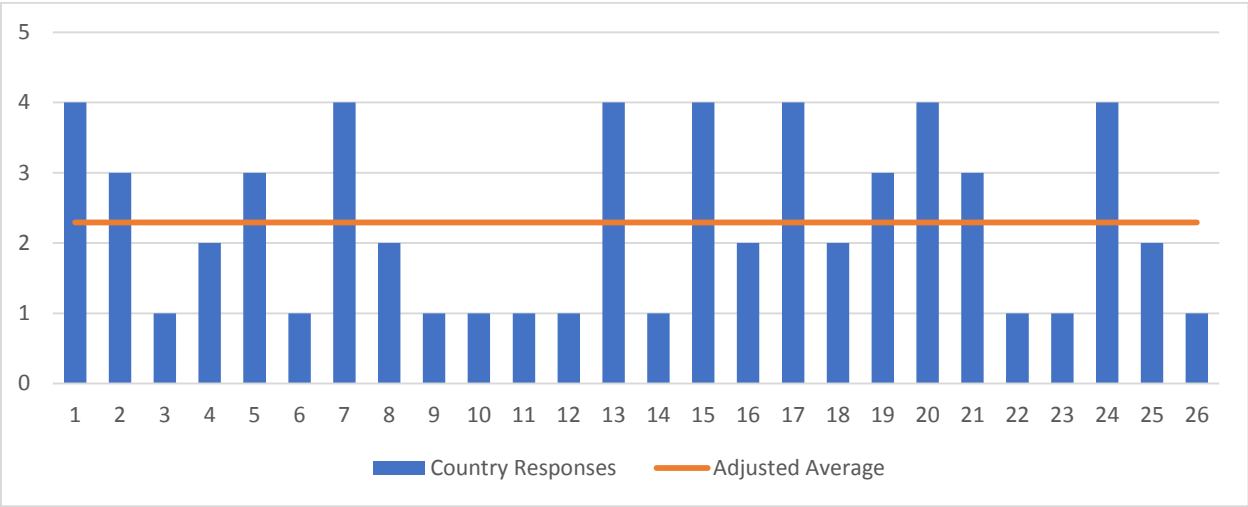
**3.1. User-centred Design.** *How does the tax administration collaborate with taxpayers (co-design, consultation and feedback) when designing their digital services so they respond to user needs?*



**3.2. Third Party Involvement.** *How are third parties engaged by the tax administration to help develop and implement digital services?*



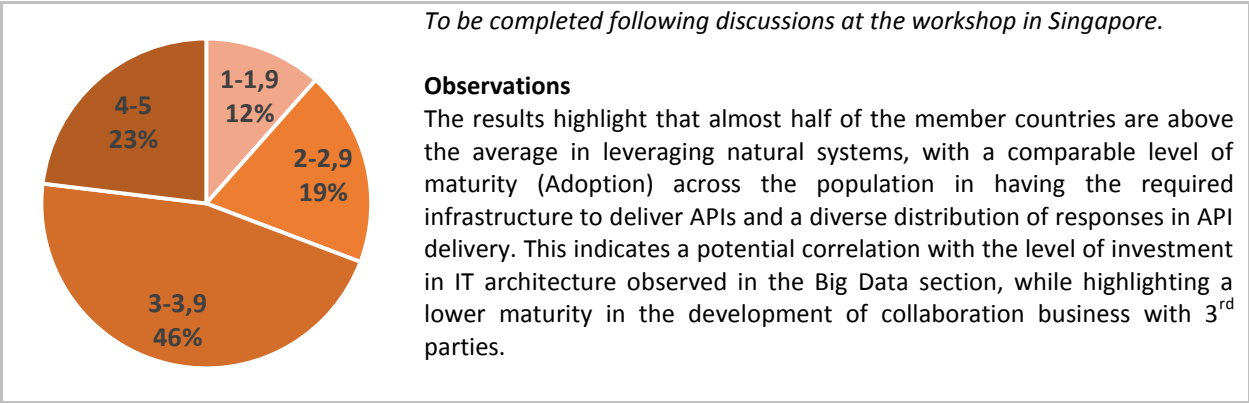
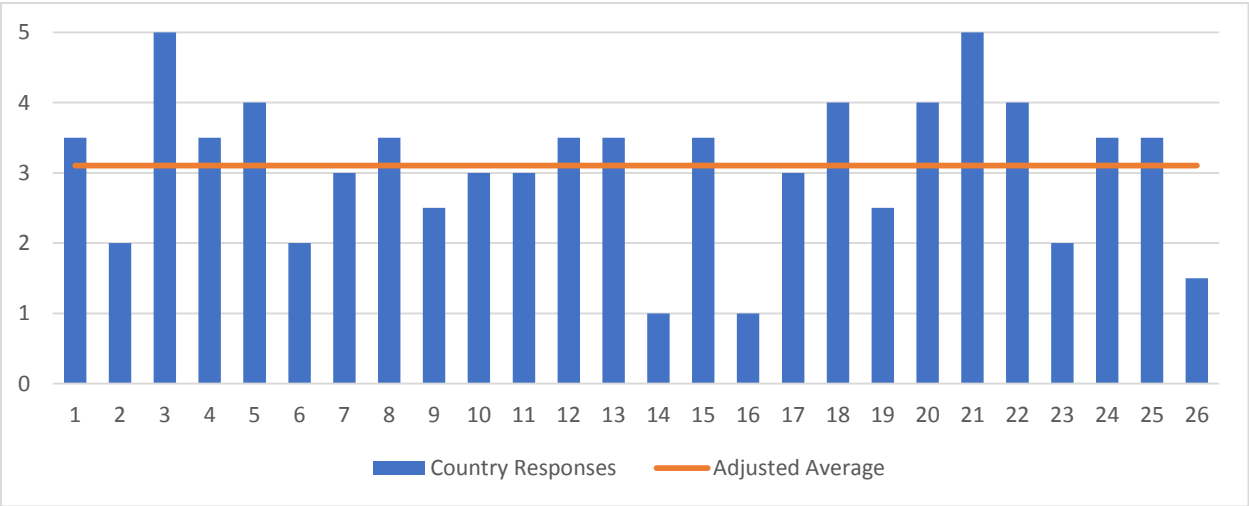
**3.3. Natural Systems and Integration.** *To what extent are services embedded in natural systems and processes used every day by taxpayers to minimise compliance costs and encourage voluntary compliance?*



4. Products and Services

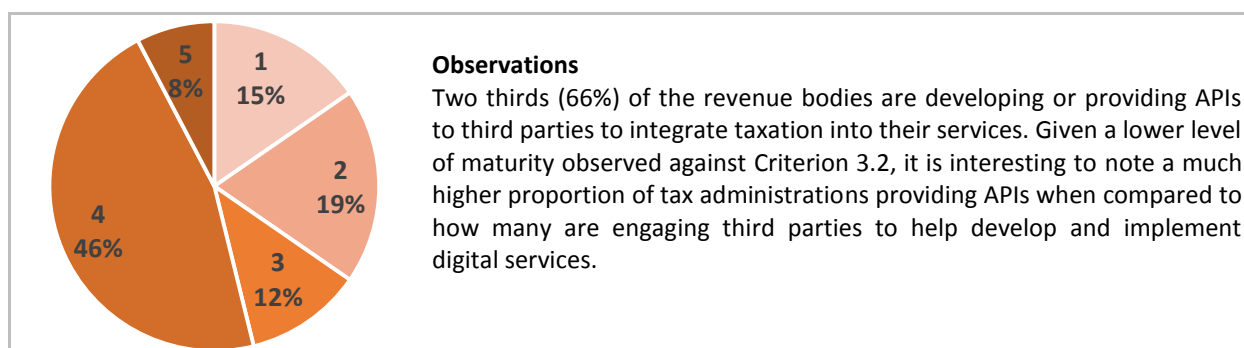
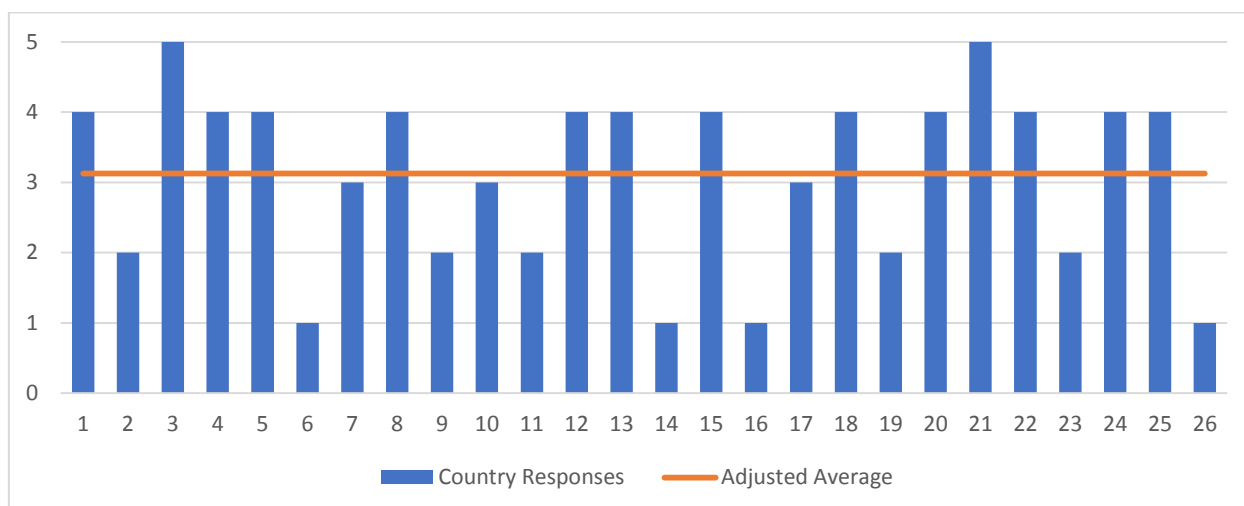
Integrated delivery of e-services within the natural taxpayer environment requires collaboration with software developers and 3<sup>rd</sup> party service providers and this category examines how mature the revenue bodies are in collaborating with this sector.

**Y Axis Legend:** 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice.

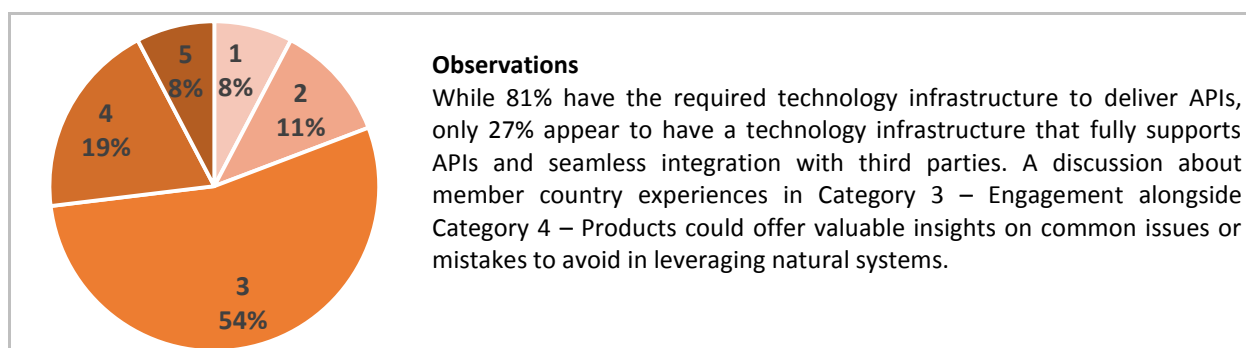
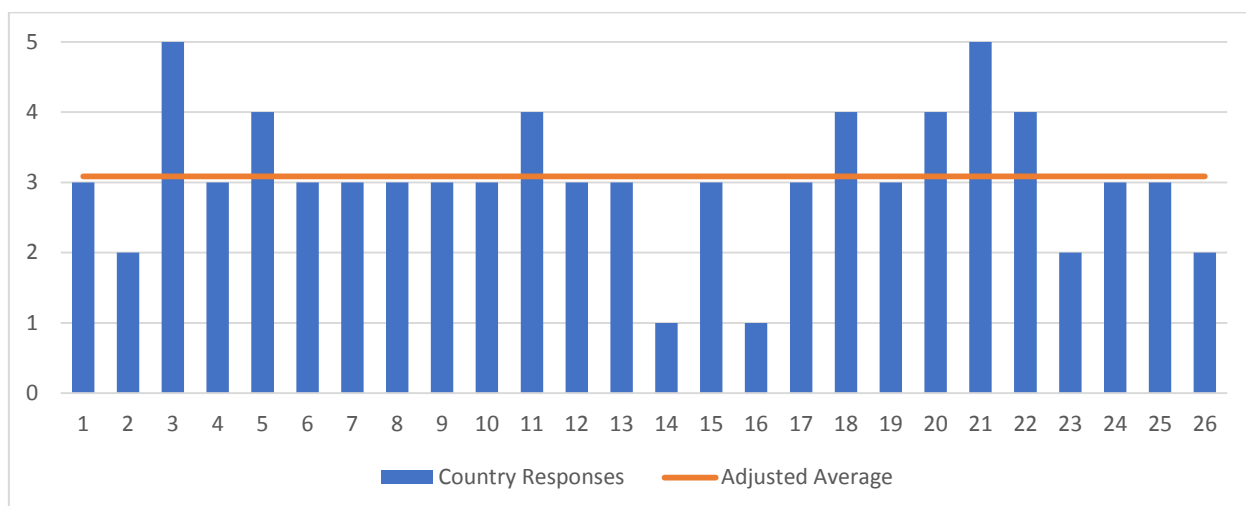




**4.1. Delivery of APIs.** *How is the tax administration creating APIs and engaging third parties to integrate and develop software to support these APIs?*



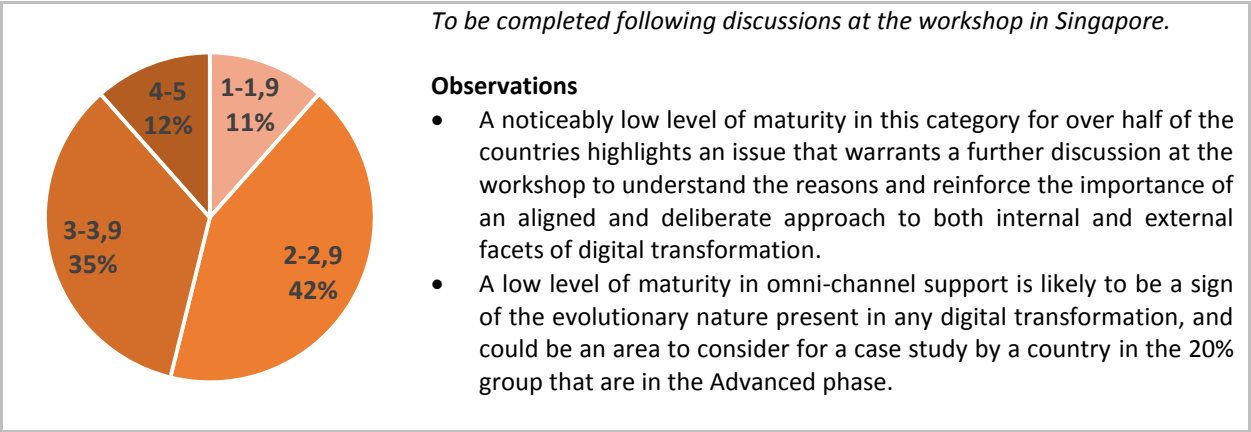
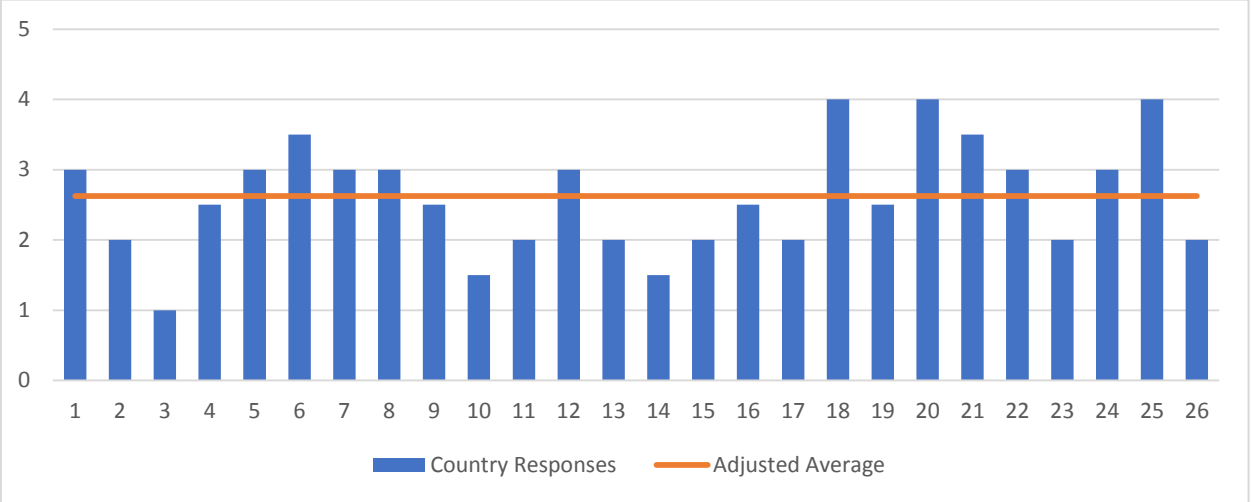
**4.2. APIs – Technology.** *What technology infrastructure to support API development does the tax administration have?*



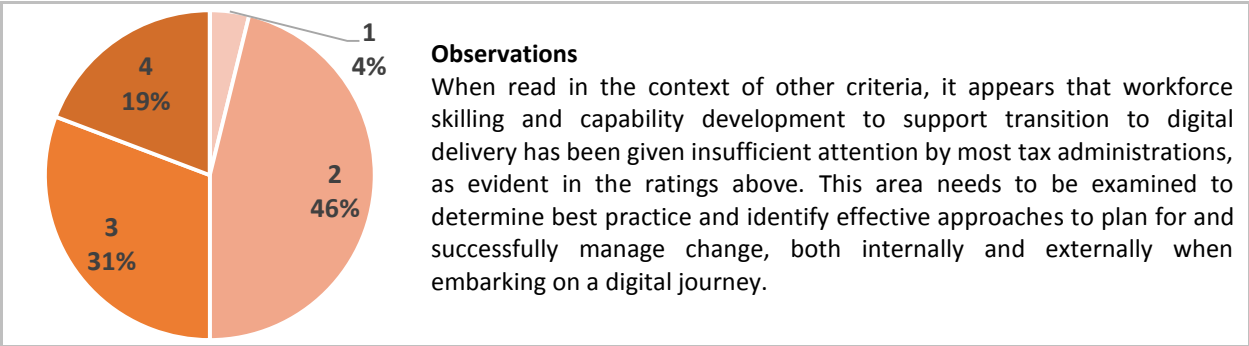
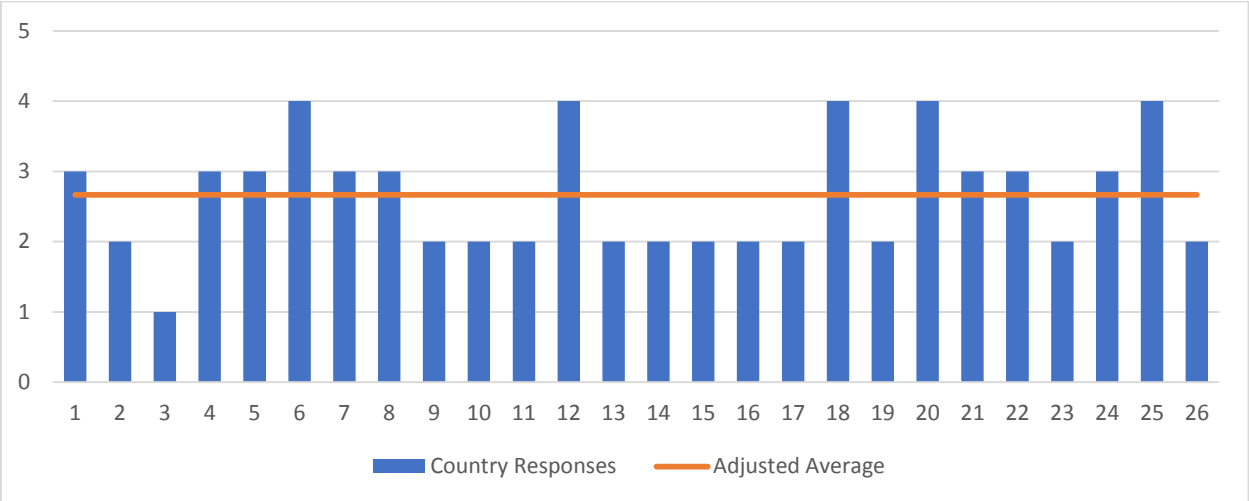
5. Support to transition

This category assesses the level of staff preparedness and ability to bring the digital vision of their tax administration to life, looking both at the level of new capabilities being developed and provision of integrated in-channel support across all digital channels.

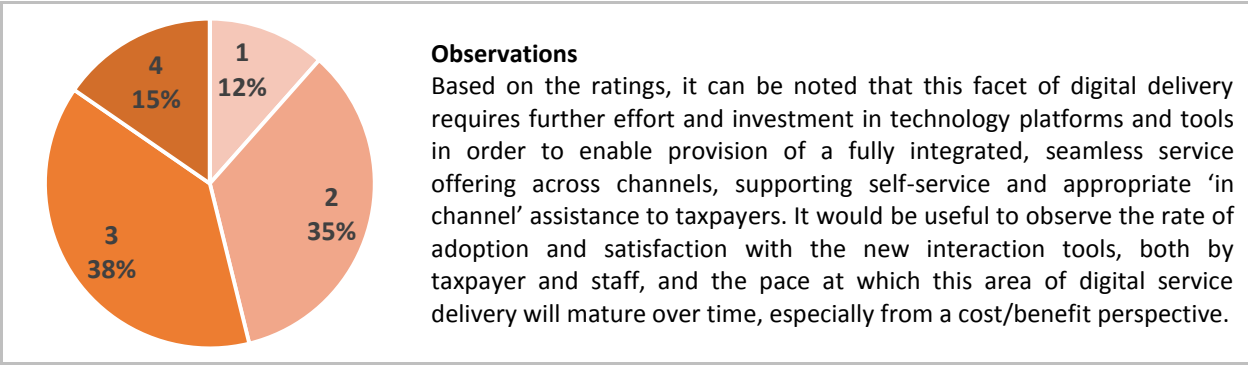
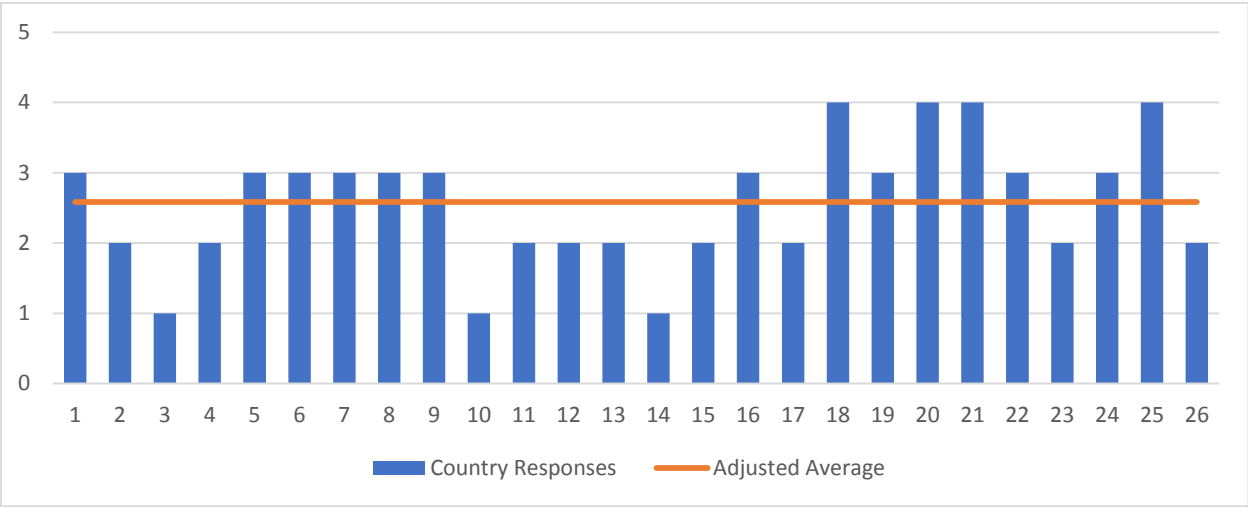
**Y Axis Legend:** 1 - Nascent, 2 - Emerging, 3 - Adoption, 4 - Advanced, 5 - Leading Practice.



5.1. Staff Capability. What skills and capabilities does the current tax administration workforce have to support the future direction of the organisation?



**5.2. Omni-channel Experience.** *How integrated is the tax administrations’ offering that promotes self-service and provides a seamless experience across mobile and online channels, and provides more intensive support to taxpayers who require it?*



## Appendix. Tax Administration Digital Maturity Assessment Model

## Digital Maturity Analytics – Big Data

Category	Heading	Assessment Criteria				
		Nascent (1)	Emerging (2)	Adoption (3)	Advanced (4)	Leading practice (5)
1. Organisation	<b>1.1 Data-Driven Culture</b>  <i>How much do the tax administration's senior executives support a data driven culture?</i>	Senior executives have little awareness of the advantages of data-driven approaches.	Senior executives are aware of the advantages of being data-driven, and are exploring initiatives that may generate benefits.	The tax administration understands what being data-driven means. The Chief Data Officer (or equivalent) role or position may have been introduced.	Executives and staff view the tax administration's culture as data-driven. Data-driven approaches are not uncommon throughout the organization. The Chief Data Officer (or equivalent) receives more empowerment.	A data-driven culture exists across all levels of the tax administration, and across all aspects of the tax administration's business including internal and external functions.
	<b>1.2 Approach to Data</b>  <i>What is the nature of the working relationship between IT and business functions for data initiatives?</i>	IT controls access to data.	IT and business functions discuss business issues and options.	IT and business functions work collaboratively to address selected issues.	IT and business functions are working together as a team.	There exists strong collaboration between business and IT functions, resulting in a unified approach to data-driven initiatives and governance of these initiatives.

<b>1. Organisation</b>	<b>1.3 Data Access</b>  <i>How much is data access shared across the tax administration, resulting in a data driven culture?</i>	Business segments or functions undertake their own analysis using data they source and collect.	Little collaborative work to understand data or solve business issues.	Multifunctional teams spread the advantages of a data-driven culture through the tax administration.	Projects with successful implementation histories are bringing all parts of the tax administration into a data-driven culture.	Flexible data access is available for business users with some level of guidance and support from IT.
<b>2. Capability</b>	<b>2.1 Data Sharing</b>  <i>How established is a data sharing culture within the tax administration?</i>	There is no data sharing culture within the tax administration.	There is no data sharing culture within the tax administration.	While there is no identifiable data sharing culture, new capabilities are being developed with some existing staff being trained.	A data sharing culture is evident in the way problems and issues are worked on.	A digital data sharing culture exists.
<b>2. Capability</b>	<b>2.2 Data Issue Resolution</b>  <i>What processes are established in the tax administration to provide an efficient resolution to data issues?</i>	IT departments' priorities for data do not match the needs of users.	It takes IT too long to respond to business department queries.	Multifunctional teams address issues of data use and sharing.	Various avenues of resolving data issues exist, serving different parts of the tax administration i.e. data centre of excellence established.	Established relationships between internal and external data source providers allowing quick resolution of data issues.

2. Capability	<p><b>2.3 Data Analytics</b></p> <p><i>What investment in analytical software and skilled staff to analyse data to improve and develop new taxpayer services has the tax administration made?</i></p>	A small number of people within the tax administration are using analytical software	Limited use of commercially available analytics software in the tax administration.	Analytics technology may be in place, but typically there is no dedicated platform or applications for analytics. Some analytics planning occurs.	A range of new or emerging technologies are in place and delivering new services to taxpayers, and tax administration support. New digital services are developed based on analytics.	Staff at various levels of the tax administration are capable of exploring data, using data discovery platforms and developing visualisations for analysis and developing new services.
2. Capability	<p><b>2.4 Analytic Tools Training</b></p> <p><i>How much has the tax administration invested in training staff to use analytic tools to support delivery of its digital vision?</i></p>	Data access is limited to IT staff.	Staff have started to develop Big Data capabilities, attending conferences and self-learning.	Some staff have begun exploring analytic solutions to business problems. Advanced analytics are starting to be used by members of multifunctional teams.	Staff are thinking in terms of a digital ecosystem that encourages innovation and enables users to explore new types of data and e-services across platforms.	Staff have enough knowledge to use self-service analytic tools and are capable of achieving objectives using agile development methods.
2. Capability	<p><b>2.5 Self Service Technology</b></p> <p><i>How established is the tax administration's platform to effectively provide self-service technology?</i></p>	Tax administration staff are not using self-service technology.	Some capability to use spread sheet software in business departments.	Referencing best practices of other tax administration offices and the private sector, the tax administration is beginning to establish the case for being data-driven.	The tax administration is making wide use of self-service technologies, Big Data platforms and advanced analytics, but the integration is not seamless.	Big Data platforms and self-service technology are used within a tax administration, and are seamlessly integrated with legacy infrastructure.



3. Infrastructure	<b>3.1 IT Infrastructure Development</b> <i>How much does the tax administration engage in IT infrastructure development?</i>	Understanding of need for holistic approach to development of IT infrastructure.	IT is still considered as a cost centre but the understanding of the need for IT infrastructure is growing.	To support experimentation and discovery, sandboxes and testing contours are created within the tax administration for IT infrastructure to support big data.	Digital strategy programme is financed on par with other business programmes in a co-ordinated way.	IT infrastructure development takes place in an agile environment.
3. Infrastructure	<b>3.2 Data &amp; IT Value</b> <i>How does the tax administration view IT and data generated assets that enable the tax administration to meet its digital outcomes?</i>	Some understanding of IT and data as facilitating improvement of compliance and taxpayer services.	Data and IT are viewed as value-generating rather than cost-generating sides of tax administration	Data and IT are recognised as a value-generating asset by the tax administration.	Data and IT are utilised as value generators across all functional groups within the tax administration and enable tax administration outcomes.	Data and IT are seen as value-generating parts of the tax administration, and processes are established to measure benefits and the return on investment resulting from these initiatives.
3. Infrastructure	<b>3.3 IT Investments</b> <i>How has the tax administration invested in IT infrastructure to support its current and future digital outcomes?</i>	Limited investments in analytic tools and service delivery.	Tax administration is focused on developing effective analytic tools and digital services.	Tax administration is investing in hardware and software procurement, which is generally responsive to need	Tax administration is investing in various IT infrastructure projects, but there may be discrepancies between the IT investments and the tax administration needs, current and in to the future	Tax administration is investing in effective analytic tools, products, and infrastructure, and this investment is aligned to current and future administration needs and business problems.

<p><b>3. Infrastructure</b></p>	<p><b>3.4 Unified IT architecture</b></p> <p><i>How unified is the tax administration's IT architecture?</i></p>	<p>Ability to combine data for analysis and developing new services is limited by decentralised data sets, a lack of software and an absence of unified IT architecture within the tax administration.</p>	<p>IT is starting to develop digital infrastructure, often without involving business departments.</p>	<p>The tax administration is starting to consider building a unified architecture.</p>	<p>Architecture takes an ecosystem approach and is unified to support analytics and provision of taxpayer services regardless of technology platforms.</p>	<p>Unified architecture platforms are expanded across entire tax administration.</p>
<p><b>4. Governance</b></p>	<p><b>4.1 Data Governance</b></p> <p><i>What processes and controls are in place for data management across the tax administration?</i></p>	<p>No data governance in place.</p>	<p>Need for governance is realised among some senior executives.</p>	<p>Tax administration adopts a governance plan, and puts in place processes to ensure its adherence. Tax administration is starting to implement data quality management and control.</p>	<p>Robust governance policy provides stewardship of data management across the tax administration.</p>	<p>Data governance is well established and understood at all levels of tax administration.</p>
<p><b>5. Data</b></p>	<p><b>5.1 Data Strategy</b></p> <p><i>What data strategy does the tax administration have in place that covers multiple data sources, along with different data types?</i></p>	<p>No formal data strategy.</p>	<p>Business and IT managers have started to develop a holistic vision for data and data integration to assist in developing new e-services.</p>	<p>Although no data strategy is in place, infrastructure is being developed so users can access multiple data sources and types.</p>	<p>A data strategy is in place covering all types of data, including structured and unstructured data, and internal and external data, and implementation the tax administration's priority.</p>	<p>Data strategy is updated in an agile way to meet new challenges and make best use of innovative technologies and growing knowledge within the tax administration.</p>

5. Data	<b>5.2 Data Quality</b>  <i>How high is the quality of data in the tax administration?</i>	Poor data quality and consistency. Low data volumes.	Poor data quality has been identified, but remedial work is limited. Inconsistencies and errors are contained in the data bases	The tax administration is investing significant resources to improve data quality.	The tax administration is making use of available data and is using new data, as the need arises. New data can be quickly made part of the digital infrastructure and used for analytic and e-service delivery purposes.	The tax administration is using data across its operations to provide innovative approaches and technologies to draw insights that create the environment for better compliance and delivery of services.
5. Data	<b>5.3 Data Centralisation</b>  <i>What shared data resources does the tax administration have in place to provide a consistent and consolidated view of data?</i>	Data is decentralised and stored in disconnected silos. No horizontal data sharing is taking place.	Creation of a shared data resource is being discussed so that users have relevant, consistent and timely data.	Tax administration is working on data consolidation to provide consistency of data to all internal and external users.	Data is stored in shared resources with administered data access rights within tax administration.	Data is stored in shared resources, and interfaces between these resources allow transfer of data to and from these resources to the platform best suited to make use of this data.
5. Data	<b>5.4 Use of Big Data</b>  <i>How does the tax administration use Big Data to support its digital outcomes?</i>	Big Data is not used. Limited to simple analytic tools provided by spreadsheet software	Tax administration begins to realize the benefits of advanced data analytics. Big Data awareness is starting. Some ad hoc querying and visualisation is occurring based on descriptive analytics but is not necessarily used to identify emerging trends.	Big Data is starting to provide more sophisticated discovery and visualisation tools, largely to analyse and manage tax compliance risks and inform the delivery of customer centric services.	Big Data is facilitating compliance activity, business processes and taxpayer services. Taxation is being moved closer to the point of transaction.	Big Data is used in real-time or near real-time mode to make tax assessments of individual taxpayers, deliver services, and support no-return or pre-filled return approaches.

<p><b>5. Data</b></p>	<p><b>5.5 Multiple channels of data acquisition</b></p> <p><i>How does the tax administration use data from different channels to improve and develop new services and understand taxpayer compliance?</i></p>	<p>There are multiple sources of data, but they are used occasionally and not systematically.</p>	<p>There are multiple sources of data, but they are used occasionally and not systematically.</p>	<p>Experimenting with bringing together different data sources. New analytic tools and digital services are starting to be implemented.</p>	<p>Big Data from multiple channels, including social media, is used to: allow a better understanding of taxpayer behaviour and needs; manage risk; improve customised service; and improve responsiveness to change.</p>	<p>A wide range of structured and unstructured Big Data from outside sources is included in the risk models to highlight non-compliance or opportunities to improve services.</p>
<p><b>5. Data</b></p>	<p><b>5.6 Structured and Unstructured Data</b></p> <p><i>How does the tax administration use structured and unstructured data?</i></p>	<p>Tax administration uses structured transactional or event type information.</p>	<p>Only structured data is used.</p>	<p>Tax administration considers the use of unstructured data (for example, texts, emails, video, audio – including recorded call centre conversations, social media, graphs, etc.) and its fusion into analytic and digital service delivery tools.</p>	<p>Structured and unstructured Big Data sets are fused to support business processes in some or all parts of tax administration, firstly for case identification, selection, compliance audits and decision-making.</p>	<p>Structured and unstructured Big Data sets are used to support all business processes across the tax administration.</p>

## Digital Maturity Analytics – Portals &amp; Natural Systems

Category	Heading	Assessment Criteria				
		Nascent (1)	Emerging (2)	Adoption (3)	Advanced (4)	Leading practice (5)
1. Online tools and services	<b>1.1 Information available</b>  <i>How easy to access and use is the tax administration's website?</i>	The tax administration does not have a website presence.	The website provides basic static information about the tax administration.	The website is up-to-date, but information is hard to find.	The website is up-to-date, easy to access and includes real-time help such as web-chat.	The website is customer focused, provides tailored information, and proactively supports both taxpayers and tax administration staff. It includes live chat which supports artificial intelligence technology.
	<b>1.2 End to end digital services</b>  <i>How do taxpayers transact digitally with the tax administration?</i>	No transactions can currently be completed digitally	Some simple one and two way transactions are possible digitally (for example, downloadable forms for offline completion).	The majority of two-way interactions can be completed digitally end-to-end.	Services are efficiently integrated into a portal with a single entry point.	Services are seamlessly and fully integrated with taxpayers' natural online environment (for example, e-banking solutions).

1. Online tools and services	<p><b>1.3 Digital services</b></p> <p><i>To what extent are the tax administration services user-centred?</i></p>	Tax administration only provides Only one-way information-type services are provided.	One-way or and simple two-way communication services are available.	Two- way non-digital interactions services with taxpayers are commonplace. Services allow supporting to conduct a range of transactions are possible without processes being digital end-to-end	Taxpayers have access to full digital end-to-end service for most activities.	Digital services are seamlessly integrated with third party software and taxpayer processes, making tax compliance a by-product of natural processes and systems.
1. Online tools and services	<p><b>1.4 Authentication</b></p> <p><i>How advanced is the tax administration's secure online environment requiring user verification?</i></p>	There are no services that require authenticated access.	No services that require authenticated access, but there are plans for development.	Some personalised portal services requiring authentication (for example, logins and passwords, personal identification numbers, shared secrets, tokens and/or code cards) are available.	Portal provides a single point of access. Security control is calibrated by the sensitivity of data being accessed. Digital certificates are common. Biometric authentication technology is starting to be used.	Security access is integrated into taxpayers' natural environment and taxpayers no longer need specialised knowledge to access personal online accounts nor memorise passwords. Big Data analytical tools are used to identify and respond to cyber-attacks.

<b>1. Online tools and services</b>	<p><b>1.5 Accessibility &amp; Availability</b></p> <p><i>To what extent are taxpayers able to access tax administration services (informational and transactional) from any device in real-time? Have Web Content Accessibility Guidelines or other standards been adopted?</i></p>	<p>No services can be accessed digitally.</p>	<p>Services can only be accessed from certain devices and are not mobile optimised. The requirements to make services accessible to taxpayers with disabilities and language limitations are understood.</p>	<p>Limited services are optimised for different devices. Some services comply with accessibility standards.</p>	<p>Most services are device agnostic. All services are real-time and available 24/7. Most services comply with accessibility standards.</p>	<p>All services are device agnostic. Additional elements are being developed beyond current accessibility standards.</p>
<b>1. Online tools and services</b>	<p><b>1.6 Service Delivery by segment</b></p> <p><i>How are services tailored to audience segment needs, or are they aligned by revenue, product or the tax administration's structure?</i></p>	<p>Services are not structured in line with taxpayer segments.</p>	<p>Services may be partially structured to some taxpayers by segment.</p>	<p>Services are structured by a taxpayer segments. Some services are based on life events relevant for specific taxpayer segments.</p>	<p>Complete end-to-end delivery of tailored services developed from taxpayer perspective. Services are personalised to meet taxpayer expectations and are often based around life events.</p>	<p>Services are tailored to meet taxpayer expectations and are often based around life events. Services are individually tailored. Portal is able to track user journeys; identify language preferences; and identify taxpayers' service preferences. Personalisation is done in real-time or near real-time based on available taxpayer data.</p>



<b>1. Online tools and services</b>	<p><b>1.7 Level of Personalisation</b></p> <p><i>How does the tax administration use personalised data to enhance electronic interaction with taxpayers?</i></p>	<p>Online services are neither segmented nor personalised.</p>	<p>Some personalised services are available generally based on static data. Submissions and lodgements are batch or manually processed. Taxpayers must manually transpose or enter information from another source.</p>	<p>Services are mobile-optimised and provide access to basic account enquiry, e-filing and e-payment options, and basic service preferences can be saved. Government or third-party calculation software is incorporated into the portal. Taxpayers are able to import or download data for pre-filling of forms.</p>	<p>Services can: geo-reference and display relevant information based on the taxpayers' current location; identify language preferences; track user journeys, and derive additional facts about the taxpayer from other information sources. Delivery of digital services uses Big Data which may be shared between different parts of tax administration.</p>	<p>Taxpayers are provided with the ability to customise the service for their use with information which is most relevant to their current context, and may have the ability to provide a forecast or simulated predictive position about their situation. Real-time or near real-time personalisation is based on available taxpayer data. Real-time or near real-time responses are delivered via an omni-channel multi-platform.</p>
<b>2. Products and services or Support to transition</b>	<p><b>2.1 Whole of Government Single Entry Point</b></p> <p><i>How does the tax administration entry point integrate with other government services?</i></p>	<p>Government services are provided separately by each individual body. A whole-of government portal is under discussion.</p>	<p>Several shared services are under development, but not yet available to taxpayers.</p>	<p>The tax administration's web portal is linked to a whole of-government web portal. A separate security procedure is required to access tax services.</p>	<p>Tax administration services are accessible from a whole-of-government portal using a unified authentication procedure.</p>	<p>A single portal serves as an entry point to access all government services regardless of platform or device.</p>



3. Engagement	<p><b>3.1 User-centred design</b></p> <p><i>How does the tax administration collaborate with taxpayers (co-design, consultation and feedback) when designing their digital services so they respond to user needs?</i></p>	Taxpayers are not engaged in the development of services.	Taxpayer insights are actively used.	The tax administration is under pressure from taxpayers to deliver contemporary digital services. Limited interaction with taxpayers to learn what is driving demand, means most services are developed based on the “gut-feel” of staff.	Digital services are based on taxpayer feedback and expectations, with reference groups structured by segment and/or types of e-services supporting this.	Taxpayers and their representatives are involved in the development of digital services in an agile environment (for example, featuring frequent iteration, private and public beta releases and rapid delivery).
3. Engagement	<p><b>3.2 Third party involvement</b></p> <p><i>How are third parties engaged by the tax administration to help develop and implement digital services?</i></p>	The tax administration does not engage with third parties in service provision.	The tax administration enters into agreements with third parties, including pilot projects.	The tax administration has agreements with major third parties.	The tax administration actively collaborates with many third parties, covering most taxpayers.	There is full mutually beneficial co-operation with third parties, covering all taxpayer segments.
3. Engagement	<p><b>3.3 Natural systems and integration</b></p> <p><i>To what extent are services embedded in natural systems and processes used every day by taxpayers to minimise compliance costs and encourage voluntary compliance?</i></p>	Taxpayers must regularly engage directly with the tax administration to fulfil obligations resulting in extra costs.	Only participants of limited pilot projects can test integration with natural systems.	Customers of major third parties may interact with the tax administration through natural systems.	Most taxpayers can interact through natural systems with the tax administration through third-parties.	Taxpayers can fulfil all their obligations through elements of their natural environment to minimise compliance costs. A fully seamless experience.

<b>4. Products and Services</b>	<b>4.1 Delivery of APIs</b>  <i>How is the tax administration creating APIs and engaging third parties to integrate and develop software to support these APIs?</i>	APIs are not provided by the tax administration to third parties	The tax administration has developed APIs and are within a testing environment with third parties.	The tax administration has begun engaging third parties to integrate and develop APIs into their services, but there is no or relatively low take-up (for example, integration into products).	The tax administration has provided various APIs to third parties who have integrated and developed them into their services.	The tax administration has a transparent API platform allowing third parties to co-design and maintain services.
<b>4. Products and Services</b>	<b>4.2 APIs – Technology</b>  <i>What technology infrastructure to support API development does the tax administration have?</i>	Technology infrastructure does not support the creation of APIs	The need to update the technology infrastructure has been identified by senior management to build an internal capability to support API development.	Technology infrastructure can develop and support APIs.	Technology infrastructure can develop and support multiple APIs.	Technology infrastructure fully supports APIs, resulting in seamless integration with third party services
<b>5. Support to transition</b>	<b>5.1 Staff Capability</b>  <i>What skills and capabilities does the current tax administration workforce have to support the future direction of the organisation?</i>	Staff largely support legacy roles and processes rather than working with APIs and natural systems.	Senior staff realise staff need new skills and are preparing for this change.	Staff are gradually being re-oriented to be capable of working with APIs capabilities. Roles and processes are being overhauled.	Most staff are learning the new skills necessary to work within natural systems; new capabilities are sourced for the organisation.	Revenue bodies have professional qualified staff with clearly assigned roles to work with natural systems.

<b>5. Support to transition</b>	<p><b>5.2 Omni-channel experience</b></p> <p><i>How integrated is the tax administrations' offering that promotes self-service and provides a seamless experience across mobile and online channels, and provides more intensive support to taxpayers who require it?</i></p>	<p>Interactions must be restarted when changing channels.</p>	<p>There is recognition and increasing desire to establish an omni-channel experience by integrating channels.</p>	<p>Services that contribute to providing an omni-channel service are being made available in pilot or in isolation (e.g. web-chat is not integrated with virtual assistance).</p>	<p>Services as part of an omni-channel offering are starting to become integrated to support seamless transitions across channels. Automated solutions have been deployed to support 24/7 self-service (e.g. virtual assistance).</p>	<p>A fully integrated, seamless service offering across channels is available so clients can self-help or get intensive support as needed (e.g. screen-share solutions). Artificial intelligence solutions are in place.</p>
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## Glossary

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<b>Advanced analytics</b>	Technologies allowing to efficient processing of large sets of unstructured data, using sophisticated approaches such as pattern recognition, outlier detection, cluster analysis, experimental design, network analysis, and text mining.
<b>Application Programming Interface (API)</b>	Open sets of standards that describe how information can be exchanged between applications and services.
<b>Artificial Intelligence Solutions</b>	The development of computer solutions that can undertake tasks normally requiring human intelligence; this includes but is not limited to speech recognition, decision-making, and basic repeatable processes.
<b>Big Data</b>	Extremely large sets of structured and unstructured data that may be analysed computationally to reveal patterns, trends, and association, especially relating to human behaviour and interactions
<b>Biometric Authentication Technology</b>	It is a type of system that relies on the unique biological characteristic of individuals to verify identity for secure access to electronic systems. Biometric examples include finger prints, voice prints, retinal scans etc.
<b>Chief Data Officer</b>	The title is not the issue, but rather does the tax administration have a position responsible for the integration of source data, data management, data cleansing, consistency of data on all service delivery platforms, data governance, data stewardship, data quality, metadata management, data architecture, data model, data re-use as well as, to a certain point, data security.
<b>Data-Driven Culture</b>	A culture where data is viewed as a competitive asset, it is visible and accessible and valued as much as intuition and experience.
<b>Data Governance</b>	Overall management of the availability, usability, integrity, and security of the data employed in an organisation
<b>Device agnostic</b>	Hardware or software that is compatible with many types of platform or operating systems.
<b>Digital Certificates/ Digital Signatures</b>	Refers to Public Key Infrastructure (PKI)- basically this is a security protocol that uses a pair of “keys”, one normally held by the taxpayer (not always the case) and the other by the administration. A taxpayer uses their key to log in, sign and submit information which is compared against the key held by the administration. Both must match in order for data to be accepted or for the user to be allowed access to the tax administration’s secure services. A digital certificate or digital signature fulfils the same function.
<b>Identity Authentication</b>	Assurance as to the identity of the person or his/her intermediary who transacted the data (both direction) or accessed taxpayer data.
<b>Live chat</b>	Refers to live ‘chat’ support offered on a portal or in an application. It allows the customer to click a button (image or text) to converse with a customer service representative in real-time via typing. It may also be referred to as a ‘click to chat’.
<b>Mobile Optimised</b>	An advanced website that will reformat itself for a list of handheld or tablet devices. Larger navigation buttons, reformatted content and differently

optimized images appear when the user is on another device.

<b>Multifunctional teams</b>	Highly skilled team consisting of individuals who are analytic, creative, technical, social, and have sound design and policy skills in addition to strong business skills.
<b>Natural systems</b>	An environment within which individuals and businesses carry out their daily activities, also called their 'ecosystem'. This refers to tax administrations leveraging off what is already available in taxpayers' daily lives to work or manage their tax affairs.
<b>Omni-channel Approach</b>	Refers to tax administration using multiple channels of service delivery, allowing customers to seamlessly switch between them, regardless of device or platform they are using.
<b>Personalised data</b>	Refers to the tailoring a service or product to accommodate specific individual requirements.
<b>Portals</b>	Secure website, online platform or similar system where taxpayers can interact with tax administrations in online mode.
<b>Pre-filling of data</b>	This term implies a level of information being supplied beyond simple name and address type information
<b>Real-time</b>	Processing of a transaction or the supply of information without delay so that the results or outcome can be relied upon.
<b>Seamless Service</b>	Services that require little to no effort from taxpayers, where compliance processes are usually embedded into taxpayers' natural environment.
<b>Single Entry Point</b>	Refers to providing access to all services and products via single portal, platform or application with unified identification and authentication system.
<b>Transaction</b>	Single exchange of data carried out between an individual or business and government to achieve an outcome, i.e. applying for a tax identifier.
<b>Unstructured Data</b>	Data sets containing information in various formats from a variety of sources, that cannot be easily processed using legacy analytics tools (e.g. images, audio, video, sensor data etc.)
<b>User-centred design</b>	A design process, in which the needs, preferences, requirements and limitations of end users of a service or product are given the priority at each stage of the design process.
<b>User journeys</b>	All steps and processes that the user is required to take to interact with a product or a service, including all possible obstacles and problems, expected actions and results etc.
<b>Whole of Government</b>	Refers to system, where all government agencies working as a coherent whole and is designed around the needs of customers and not around the structures of government.
<b>Web-content accessibility guidelines</b>	A set of guidelines that specify how to make content accessible, primarily for people with disabilities, but also for all user agents, including highly limited devices, such as mobile phones.

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