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Big data analysis in public administration – the role of a modern SAI

I would like to dedicate this short speech to all officials in public administration who are pushing the limits. To all officials who are doing their best to innovate public services, taking into consideration as much data as possible to create new quality while serving their citizens. Citizens who have entrusted them with their taxes so that public administration works efficiently and keeps on developing.

We are living in a flow of data. Over 2.5 quintillion bytes of data are generated every single day. And if you make a simple calculation, during my speech around 90 quadrillion bytes or 84 million Gigabytes of data will be generated. This continuous flow of data in various formats is generally recognised as big data.

And as we know, a great benefit is created with this resource. This is no surprise: data have been declared the oil of the 21st century.

Being in the midst of these beneficial resources in such vast amounts, you can easily focus on accumulating these resources and making "owning" them main target – this way the data become the end in itself. Not the means to achieving objectives.

New technologies have created unprecedented opportunities for data generation and mining. But also for adding value through data processing and analysing. As a desirable result for public administration, this means a more effectively functioning and a more efficient state – more active civic participation, better policy-making, more open government, better administrative capacity-building, better public services and, last but not least, thoughtful use of public money.

Every government - I'm sure - understands the opportunities advanced big data analytics offer. But progress towards systematic and efficient data analytics is slow and bumpy. Why is this the case? What are the main obstacles governments are running up against? The main problem, in my opinion, lies not in information technology, skills or even funding, but in the mindset and tradition of how public administration usually functions – a lack of shared vision or integrity, if you will.

I believe that all of the representatives of SAIs in this room have confronted the problem of so-called 'silos' in their public administration: a situation where different ministries or public institutions are not able to cooperate effectively enough and everyone operates exclusively in their own area of responsibility. The effectiveness of governance is hindered when public institutions do not cooperate to address the challenges facing the country.

In the context of information technology and data administration, this results in **data kingdoms** within public administration. In data kingdoms where data is accumulated by public institutions but there is no thoughtful and systematic exchange of data with other data kingdoms. If there is no automatic data exchange between information systems and the possibility for data integration, then the best solution is not to collect more and more similar data to satisfy separate data kingdoms, but to create an integrated data exchange environment between information systems to allow for more meaningful and operative big data analysis.

Estonia was lucky in that around 20 years ago the development of e-governance was set as the goal of the country's public sector. Institutions were obliged to enhance database structure, create a layer for data exchange and promote e-services. Today almost all state services are available online 24 hours a day, seven days a week – they are trusted by people and widely used. The exchange of information between the state, citizens and businesses, as well as between public authorities, is continuous, digital and online. Now the public sector in Estonia is moving to an era of proactive services, or so-called invisible services. The government has

defined 15 life-event and business-event services to start with. Essentially such events, for example the birth of a child, retiring and social benefits, are designed to be transactions that can be completed as seamlessly as possible for the user. This means that life-event or business-event services are activated automatically based on the events taking place in a person's life.

To run a country where a variety of e-services (incl. invisible services) are accessible online 24/7, to make advanced big data analysis for better decision-making or even to dream about invisible e-services you need interoperable information systems. To cope with such a challenge Estonia has developed the X-Road data exchange layer, which works like an open-source highway for data traffic. It is also being used as a platform for securely amending data in multiple databases, for the transmission of large data sets and for executing searches across several databases. The unique aspect of Estonian e-governance is that it lacks a centralised or master database – all information is held in distributed data systems and can be exchanged instantly upon request.

Data kingdoms with fortified walls within public administration are major obstacles to expanding the administrative capacity of the public sector. It can also be wasteful because of duplications, starting from system development and ending with data collection. Drawing attention to these walls is also the role of modern SAIs, which should provide recommendations, in their relevant audits, for the creation of a comprehensive data exchange environment – or creation of bridges between data kingdoms, if you will. In our audits that use big data analysis, we can demonstrate to governments what can be achieved through integrated data use. I strongly believe that audit institutions are there to **nudge and empower** public administration, not let it **settle into a comfort zone within its own kingdom**. New technologies have reached every sphere of public administration and there is barely a single audit topic that has no relation or potential relation to information technology or advanced data analytics. This provides us with a great opportunity, but also places great responsibility on SAIs. We should address systemic problems related to data management: in this way we can help to improve the quality and implementation of national data strategies and capacity development. For example - in 2019 our annual report to Estonian Parliament will focus on questions how Estonian e-state is functioning and is the e-state still healthy.

To sum up, only by being an advocate of meaningful data analysis and **pointing out the walls of data kingdoms** can we best serve our citizens as modern SAIs.

Thank you!