

Development Plan of Statistics Estonia 2018–2022

Statistics Estonia as coordinator of state data
governance

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INTRODUCTION

Statistics Estonia (SE) is a state authority in the area of government of the Ministry of Finance. The strategy for 2018–2022 is the fifth long-term development plan prepared by the statistical office.

During the first strategy period (2003–2007) the focus was mainly on gaining international reliability as a producer of quality statistics, offering besides numerical data increasingly more analysis, adopting state databases, creating a web-based data transmission channel and developing web-based channels for statistics dissemination.

Users' awareness of official statistics improved considerably. Before the beginning of the strategy period, legislation was rarely and inconsistently submitted for approval of Statistics Estonia; during the strategy period the involvement of Statistics Estonia in the approval process of draft legislation, data composition of databases and used classifications increased two-fold. In the survey among journalists on the reputation of state authorities, Statistics Estonia moved in the institutional ranking from the seventh to the third place in 2006.

The second strategy (2008–2012) moved the focus from data collection to offering information service. During the period, the share of web-based data collection increased significantly – from 35% to 78% of received reports. The reuse of data in state databases increased by a third – by the end of the period, 60% of statistical activities were partially or completely based on state databases. In the last year of the strategy period, the pre-filling of enterprise questionnaires with the data of their annual reports cut the time of filling the questionnaires on average by a half, compared to the previous year. This meant a significant reduction in administrative burden.

During the period, a more detailed Official Statistics Act was adopted, which among else laid down the formation of the Statistical Council advising the system of official statistics in Estonia, long-term planning of the statistical programme, and specified the order of using the data collected for the purpose of producing official statistics in scientific research.

In 2013, Statistics Estonia adopted a rolling strategy, which means that the strategy is reviewed every year. **The third strategy** "Development directions of Statistics Estonia 2013–2018" was a transitional document used to deepen process-based organisation of work. The most important step was a change in work organisation that took effect in October 2013. It was the first time in the world that a statistical office combined the data processing of all statistical domains in one central unit, in order to increase efficiency through automation and standardisation.

Strategy 2015–2020 was the first strategy document approved by the Minister of Finance. The objective of the strategy period was to increase relevance of statistics and shorten release times.

The **new strategy** (2018–2022) of Statistics Estonia has been developed in quickly changing conditions where there are higher expectations for the use of data available in the state and for obtaining statistics quicker and with minimal administrative burden.

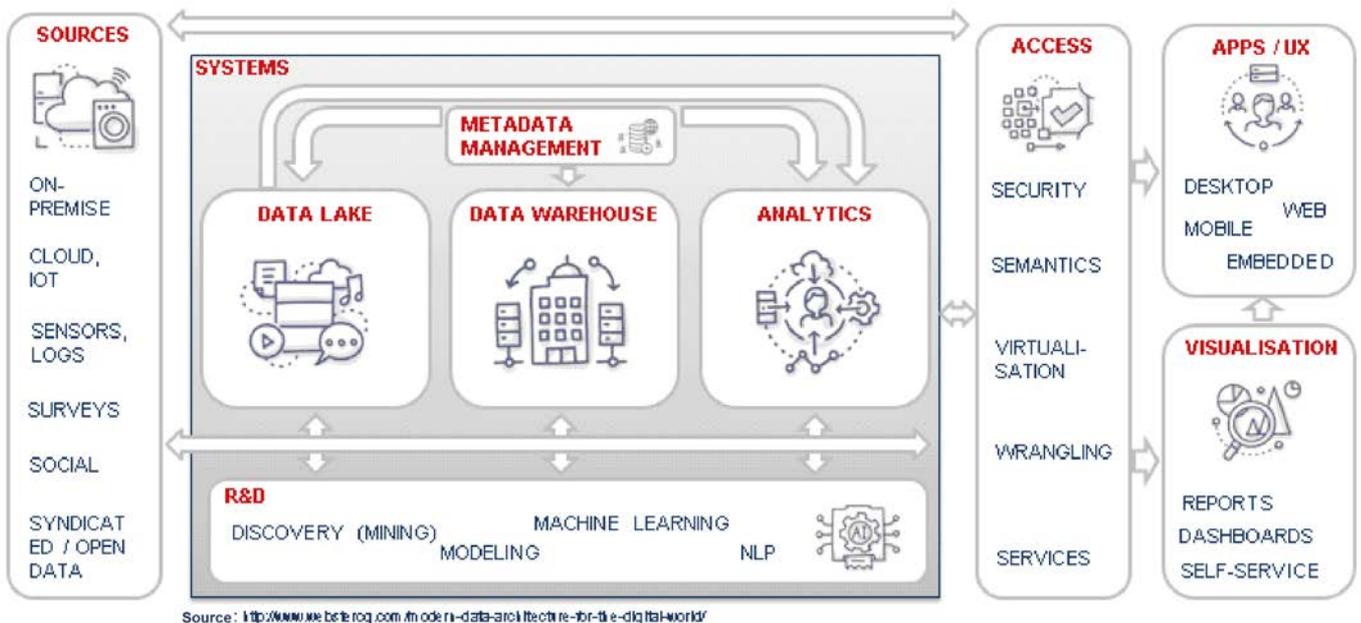
The greatest change seen for the new strategy period is transforming Statistics Estonia into a national data agency – an institution that offers data from different sources, support in using data as well as classic official statistics. At a time of information excess when data as well as statistics are offered by multiple organisations, it is becoming more important to offer statistics based on users' needs, in order for them to access the necessary information. Thus, personalised statistics and offering data sources to users are central to the new strategy.

In the new strategy period, Statistics Estonia will certainly continue negotiations with users of statistics, in order to come to an agreement to keep in the statistical programme only the statistical activities that are strictly necessary for calculating international and development plan indicators, and to find resources for fulfilling new obligations towards the European Union. Statistics Estonia will also continue to implement the information systems, created for the population and housing census, in other statistical activities, and create flexibility in the organisation, which is a precondition for fulfilling the orders of users quicker. This will be accomplished through the national joint project Reporting 3.0, by updating the statistics production information system as well as by using internal resources.

SITUATION OVERVIEW

The greatest opportunities for Statistics Estonia are associated with an increasing demand for statistics and the expectation to receive data about more phenomena and receive it quicker. There are several options for developing existing products and creating new ones. For example, it is possible to add characteristics to state databases, increase the use of classifications and other standards laid down by Statistics Estonia, adopt new data sources (data that have emerged as a result of the activities of state and private enterprises, incl. big data, such as data from mobile positioning, card payment centre, store cash register systems, bank accounts, internet posts, speed cameras etc.), increase cooperation with research institutions, participate in international cooperation networks and in producing European statistics, incl. in the development and implementation of common applications. All of this would enable to adopt new methods and technological solutions (e.g. submit and use data on smart devices, collect more geo-positioned data, use social media as a data source or as a dissemination channel) and develop existing or new products.

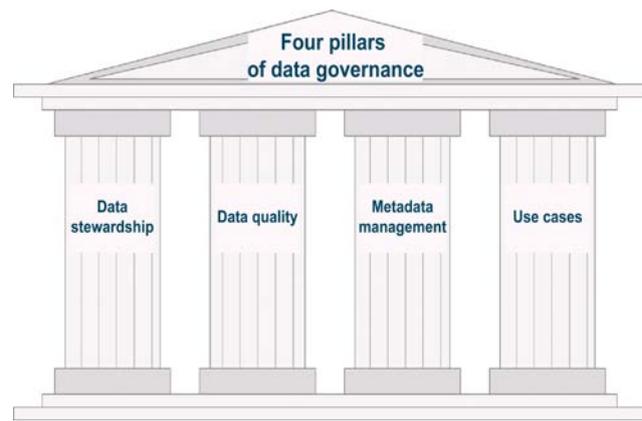
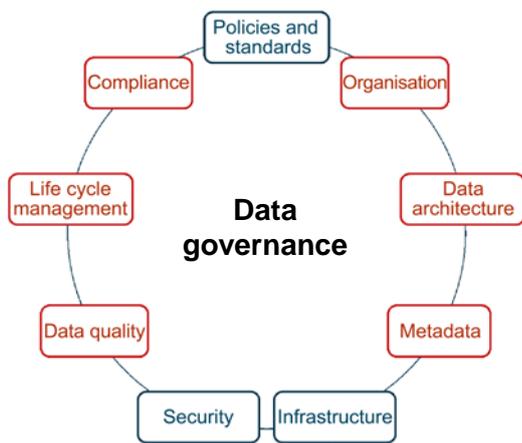
The following figure presents a simplified picture of modern data governance in Statistics Estonia.



Based on global experience, it can be claimed that successful data processing requires consistently functioning data governance. Data governance consists of several aspects, which need to be coordinated. From the viewpoint of Statistics Estonia, in Estonia, most attention has been paid to data security (ISKE requirements), however, for comprehensive data governance other aspects should also be systematically developed. Statistics Estonia is convinced that the strongest foundation of the smart state of the next decade and data-based decision-making are data that are characterised by quality, completeness, timeliness and desired content. One of the success factors for their use is a comprehensive data governance process.

As this is a new activity, its viability depends on the acquisition of resources. Statistics Estonia is prepared to actively coordinate and organise this activity.

The following figure presents the main components of data governance based on the international break-down according to the Global Data Management Community (<https://dama.org/content/body-knowledge>) and Statistics Estonia. Of the nine components of data governance, Statistics Estonia has a coordination role in six.



The greatest asset of Statistics Estonia are committed and experienced employees working in a modern working environment^a. These highly educated, committed and experienced employees produce internationally recognised and reliable statistics necessary for consumers, as shown by the results of regular user surveys^b and increasing number of media mentions. The discipline of fulfilling the statistical programme is great, deviations from the release calendar constitute under 3% of annual releases. The strength of Statistics Estonia is also demonstrated by the fact that the assessments of international missions have so far been positive. The revision rate of released statistics has been marginal. Considering the risks rising from linking more and more databases, Statistics Estonia has increasingly focused on protection of the data collected for producing statistics. So far, no data leaks or breaches of statistical confidentiality have been identified.

The disadvantages of Statistics Estonia are associated with a lack of funding. For this reason, the salary level of the institution compared to the median base salaries in similar job categories in the labour market of Tallinn and Harju county is one of the lowest. Furthermore, there is not enough money for retraining and refresher training of employees, which is much needed as job-specific tasks will be changing even more. On the one hand, the number of jobs requiring little skill is decreasing, and on the other hand, jobs are emerging that require modern knowledge and competence. The systematic development of the interoperability and modernisation of the statistical information system has been limited in the recent years. An up-to-date information and production system is a precondition for achieving the strategic objectives of Statistics Estonia. Without modernising the current system, it is not possible to produce statistics more efficiently and, thereby, meet the requirements set for the relevance and timeliness of the output.

The greatest external risks of Statistics Estonia are associated also with the movement of employees and with data protection. It is likely that in the next few years, competition for employees will increase between Statistics Estonia and banks, analysis centres, and internet and information technology enterprises, which are interested in applying the experiences and skills of SE employees in improving the efficiency of their own work processes and creating value added. Factors that could also contribute to the weakening of the market position are decreasing readiness of data providers to submit data, changes in the quality and composition of database data (approving changes in databases in the administration system for the State Information System does not ensure the use of prescribed classifications; it is not obligatory). At the same time, the risk of cyber-attacks and data leaks increases alongside data volumes. To reduce these risks, Statistics Estonia must constantly improve its data protection rules and ensure compliance with minimum ISKE-3 level.

The greatest task is to find balance between processing the increasing information volume and reducing administrative burden. The new strategy aims to improve the balance by reducing administrative burden, to increase the volume of information provided to the society and to provide information quicker.

The overview is based on SWOT-analysis of Statistics Estonia and efficiency analysis of Statistics Estonia, which the Ministry of Finance ordered from PriceWaterhouseCoopers AS in 2017.

^a The claims are based on the assessments of the 2016 employee satisfaction survey.

^b User surveys have been conducted since 1996. The results are available at: <https://www.stat.ee/user-surveys>.

MISSION

The mission of Statistics Estonia is to provide reliable and objective information about Estonia.

The mission of Statistics Estonia derives from clause 1 of section 2 “Official statistics” of the Official Statistics Act, which states that the purpose of official statistics is to reflect the situation of and changes in the society and to provide the society with information relevant to the demographic, social, economic and environmental development, including for preparing development plans and forecasts, developing different policies, conducting scientific and applied research, and making knowledge-based decisions. Official statistics are public information that comply with specific principles and quality criteria. These have been agreed by the UN Economic Commission for Europe^a and in the Treaty on European Union and explained in detail in the European Statistics Code of Practice. Compliance with the European Code of Practice is assessed by independent experts.

Statistics Estonia provides information about Estonia. Since Statistics Estonia is a part of the European Statistical System (ESS), it is also responsible for the provision of official statistics about Estonia on the international level. The ESS is a partnership uniting the national statistical institutes of the Member States, other institutions producing official statistics and Eurostat. As a general rule, Eurostat does not produce statistics. Instead, it consolidates the data received from Member States. The partnership ensures that the statistics produced in the ESS are comparable over time and space. Statistics Estonia submits statistics not only to the EU but also to many international organisations, such as the UN, OECD, etc.

Statistics Estonia also disseminates European statistics to users in Estonia, relying on its expertise and knowhow. At a time when users need more timely statistics and information than previously, the task of Statistics Estonia is to create more up-to-date solutions for disseminating data and statistics to the whole society: to researchers, representatives of public interest as well as to citizens. Statistics Estonia is guided in its activity by the Quality Assurance Framework of the ESS.

VISION

By 2022, Statistics Estonia will be the most effective and innovative producer of reliable and user-friendly statistics in Europe.

The vision of Statistics Estonia was significantly updated while developing the new strategy. The new vision considers common interests of users and data providers. The vision consists of four important elements: efficiency, innovation, user-friendliness and reliability.

- Efficiency means reducing the administrative burden created by Statistics Estonia, producing statistics quickly, the ability to respond promptly to the wishes of users and clients and strong motivation to offer the best statistics.
- Innovation means a positive change in the products, services, processes and organisation culture of Statistics Estonia, which considerably increases the speed and/or quality of producing statistics.
- User-friendliness means accessibility, relevance and timeliness of the information offered by Statistics Estonia. It also means the satisfaction of data providers and their motivation to share with the state important information for making decisions of national importance.
- Reliability means that official statistics produced by Statistics Estonia reflect the real situation as accurately, truthfully and consistently as possible, and comply with methodology and international standards.

The indicators are described in more detail under strategic objectives.

^a <http://www.unece.org/stats/archive/docs.fp.e.html>

CORE VALUES

The implementation of Statistics Estonia's mission and vision is based on three core values that underlie our decision-making and communication with stakeholders. The core values are the following.

■ Reliability

- The statistics produced by us are based on a scientifically sound and internationally recognised methodology
- We explain the used methodology and substantiate the obtained results
- We adhere to statistical confidentiality
- We publish statistics on time
- We treat all users equally
- Statistics Estonia's employees are experts in their own field
- Our activities are ethical and transparent

■ Cooperation

- We listen to clients' needs
- We take a proactive role in agreeing on national data needs
- We participate in public debates and in national and international statistical cooperation
- We keep our promises
- We support and develop internal cooperation for achieving a common objective
- We are open and straightforward in communication

■ Innovation

- We keep up to date with developments in technology and methodology
- We implement new technologies and methodologies in the production of statistics
- We seek and adopt new data sources
- We develop personalised statistics
- We dare to experiment
- We implement state-of-the-art methods and technological solutions in data science and production of statistics
- The views and initiative of our employees are the foundation of Statistics Estonia's development
- We are committed to quality and efficiency in every stage of work

STRATEGY MAP

The strategy map helps to see more clearly the links between the main objectives and measures set for realising the mission and vision. The below figure shows these links with a blue line. The main measures applied at Statistics Estonia contribute to achieving other objectives as well. The main objectives and measures are discussed in more detail in the chapters of the strategy.



MAIN OBJECTIVES

In the new strategy period, Statistics Estonia makes a strong commitment in two areas: that official statistics and information would cover areas of interest for the users, or **relevant** areas, ensuring consistency also in the longer term (consistency over time), and that they would do it in a way that is **understandable** and as **quick** as possible.

Therefore, Statistics Estonia has set three main objectives for 2018–2022. The fulfilment of these is measured with indicators.

OBJECTIVE 1. TO OFFER UNDERSTANDABLE AND RELEVANT INFORMATION ABOUT SOCIETY

The primary task of Statistics Estonia is to produce official statistics, i.e. do statistical activities according to the official statistical programme, publishing statistical indicators agreed in the order of the Government of the Republic. An additional task is to provide various services, incl. answer orders for information. As statistics needed by users have to be processed quicker and often require a simple data aggregation, the institution needs to take a step further in linking information (incl. data) and offering it to different parties. A requirement for such data exchange and linking is a clear understanding of the meaning of data and opportunities and limitations in the use of data (meta information). In the new strategy period, Statistics Estonia sets the objective to link state databases and exchange data to enable better governance decisions.

The need for statistics among the main EU and national representatives of public interest is constantly growing, and this is happening faster than before. At the same time, many users of statistics expect more detailed statistics on smaller regions and on more phenomena. Producing more detailed statistics without significantly increasing the burden on data objects requires using new data sources, methods and tools. It is also important to offer more personalised information to users than previously (in a format suitable for the user).

The objective of Statistics Estonia is to offer understandable and relevant statistics.

Indicators and target levels of the objective

Key indicators	Measurement basis	2017	2018	2019	2020	2021	2022
Considering user needs, satisfaction index	Index calculated on the basis of questionnaire regularly sent to users	68			Over 70 annually		
Statistics use, number of media mentions	In the case of published statistics, number of references to SE data and published articles	6,875			Over 7,000 annually		
Statistics use, number of website visits, millions	Number of visits to all SE websites and databases	Measured for the first time, ca 1.0	1.1	1.2	1.3	1.4	1.5
Value of grants	Total value of grants	9.8% of budget			10% of budget		
Value of contract work	Total value of contract work and services	9.5% of budget			10% of budget		

OBJECTIVE 2. TO ENSURE TIMELINESS AND RELIABILITY OF OFFICIAL STATISTICS

Statistics Estonia serves the society by producing official statistics. Official statistics are used if they cover the topics relevant for the society in a way that is understandable and impartial. Most people access official statistics through media, some through the statistical database and at analysis level, and even a smaller group use microdata for research. Statistics Estonia must serve all stakeholders and ensure availability of timely and reliable statistics for everybody.

In a world that is changing ever faster, users of statistics expect to receive statistics on phenomena of interest as quickly as possible, preferably in real time. This concerns the timeliness of data, i.e. time from the end of the reference period until the publication of data, as well as response time to orders for information, i.e. time from receiving an order for information until its fulfilment. Statistics Estonia sets as an objective to improve the timeliness of data significantly for making governance decisions. However, with faster turn-around, the risk emerges that data accuracy might decrease. In order to mitigate this risk, data and their quality must be explained better with regards to which data sources and methodology have been used. Statistics Estonia follows internationally recognised principles and quality criteria established for the production of statistics.

In order to ensure the timeliness of data, more real-time data must be used, which could reduce the reliability of results. If such information exists, it is important to understand the usability of the data source, the meaning of data itself (henceforward, meta information) and the quality of databases. When these factors are taken into account, it is possible to produce information that depicts social phenomena in less time.

The objective of Statistics Estonia is to ensure reliability and timeliness of statistics.

Indicators and target levels of the objective

Key indicators	Measurement basis	2017	2018	2019	2020	2021	2022
SE reliability, index	Index calculated based on results of survey by independent party	Change in methodology	Among top 5 government agencies	Among top 5 government agencies			
Deviations from release calendar, %	Ratio of late releases to number of all releases	2.27%	3%	Maximum 3%			
Assessments of missions, pcs	Assessments by independent organisations (incl. CoP)	All positive	All positive	All positive			

OBJECTIVE 3. TO PRODUCE QUALITY INFORMATION WITH LOW ADMINISTRATIVE BURDEN AND HIGH EFFICIENCY

As the need for information is increasing, it is important that information could be provided with the lowest administrative burden possible. The obligation of Statistics Estonia is to monitor that data is not requested repeatedly if the data already exist in some data source in the state. The guiding principle of Statistics Estonia's data collection is to implement first the data collection method that has the lowest administrative burden and cost. Besides the aforementioned, efficiency also means that in the case of interview surveys, the survey methodology permitting, the option of web interview is used first, followed by phone interview and lastly face-to-face interview.

Statistics Estonia has been optimising internal processes. In support of the new work organisation, the institutional structure has been significantly altered, and work has been started towards making processes more efficient. The information systems developed for the population and housing census are adapted to allow their use in other statistical activities as well. The implementation of new information systems has also involved describing metadata and establishing a data warehouse. These activities combined enable to produce official statistics significantly quicker than previously and reuse previously systematised data more efficiently than before. At the same time, it is clear that while aiming mainly for efficiency, the quality of official statistics must not suffer to the extent that this type of information would lose value for potential users.

The objective of Statistics Estonia is to produce quality information with low administrative burden and high efficiency.

Indicators and target levels of the objective

Key indicators	Measurement basis	2017	2018	2019	2020	2021	2022
Data providers' satisfaction, index	Index calculated based on regular survey of data providers	-43.6			≥0		
Data providers' administrative burden, hours	Time spent on filling questionnaires (by all data providers)	281,520 hours	Annual decrease of 10% calculated on previous year's level				
Time for producing main statistics, hours	Time used for programme-based main statistics activities (excl. irregular statistics and developments)	311,191 hours	Annual decrease of 10,000 hours on previous year's level				
Share of data fields from administrative databases, %	Share of data fields obtained from databases and big data in initial base	Not measured	To be defined				
Staff turnover, %	Voluntary turnover of staff	9.6%	≤10%, starting from 2020 ≤8%				
Employee motivation, motivational index	Motivational index calculated on the basis of employee satisfaction survey	Not measured	Over 7.0				

MAIN MEASURES AND AREAS OF ACTIVITY

Statistics Estonia has planned seven measures for meeting its strategic objectives^a. For a specific activity of each measure, a responsible department has been designated, which does not mean, however, that the particular department could implement the activity and measure without the contribution of other departments.

MEASURE 1. PRODUCING RELIABLE STATISTICS WITH EFFICIENCY

The main areas of activity for realising this measure are as follows.

1. To develop and create new products based on the needs of users. To develop and produce reliable statistics, commissioned by users, on the basis of the activity plan for products. Statistics Estonia will focus on offering important international and development plan indicators, while being prepared to produce statistics on commission.
 - 1.1 **Population statistics.** The domain of population statistics covers statistics of the population product group. In 2018, there are 8 statistical activities, including 7 activities of main statistics and 1 development activity of the register-based population and housing census, with a total of 203 output indicators. The main representative of public interest for population statistics is the Ministry of Social Affairs. Eurostat, the UN, the IMF and the OECD are the main international organisations ordering statistics.
 - 1.2 **Social statistics.** The domain of social statistics includes 8 product groups: well-being, income and poverty, social protection, labour market, education, justice and security, culture, and tourism. In 2018, there are 42 statistical activities with 1,477 output indicators. The main representative of public interest for social statistics is the Ministry of Social Affairs. Eurostat, the UN, the IMF and the OECD are the main international organisations ordering statistics.
 - 1.3 **Economic statistics.** Economic statistics covers 14 product groups: national accounts, finance, agriculture, energy, business statistics, enterprise trends, financial and insurance statistics, science, technology and innovation, transport, producer prices, consumer prices, labour costs, and foreign trade. In 2018, there are 84 statistical activities with 2,027 output indicators. The main representatives of public interest for economic statistics are the Ministry of Economic Affairs and Communications, the Ministry of Rural Affairs and the Ministry of Finance. Eurostat, the UN, IMF and OECD are the main international organisations ordering statistics.
 - 1.4 **Environmental statistics.** More and more environmental accounts must be developed according to the main objectives the European Strategy of Environmental Accounts. So far, six accounts have been developed; the four accounts of the so-called third wave are planned for the near future and are associated with the adoption of the relevant regulation. In 2018, there are 12 statistical activities in the the environment product group, which result in 136 output indicators. The main representatives of public interest for environmental statistics are the Ministry of the Environment, the Ministry of Rural Affairs and the Government Office. Eurostat and the UN are the main international organisations ordering statistics.
 - 1.5 **Multidomain statistics.** Multidomain statistics include the product groups of sustainable development and regional development. In 2018, there are 9 statistical activities, incl. 2 statistical activity developments. The main representatives of public interest for multidomain statistics are the Ministry of Finance and the Government Office.
2. **To reduce time spent on data submission and collection.** Statistics Estonia will continue making data collection more simple and efficient. In cooperation with the Tax and Customs Board and Eesti Pank (central bank of Estonia), data submission will be transferred to data exchange based on an API ("Reporting 3.0").

^a See the strategy map.

- 3. To seek and adopt new data sources.** A requirement for reducing administrative burden is continuous monitoring of databases and sources. In order to reduce administrative burden, Statistics Estonia will implement a principle of once-only data collection, always checking before the collection of new data whether there is a source involving less administrative burden and assessing the quality of the data therein. If such a database exists, the data are obtained from there first.
- 4. To implement qualitative research methods for improving questionnaires.** In order to ensure clear and understandable data submission, the comprehensibility of questionnaires is essential. In cooperation with partners, Statistics Estonia will evaluate questionnaires more than previously, using focus groups, cognitive interviews and other methods.
- 5. To develop and implement quality indicators of products and processes.** In order to ensure the reliability of statistics, important output indicators must have clear quality indicators. If an international quality indicator does not exist, Statistics Estonia will approve one.
- 6. To modernise methodologies used in the production of statistics and automatize the production process for higher efficiency in data processing.** Achieving high efficiency in the production of statistics requires updating data processing methods. In 2017, a new department was established for the development of data processing, with the task to quickly develop a new production system and put it into use.
- 7. To identify improvement opportunities in the main business processes by applying LEAN.** This is a support activity, which is implemented for consistently improving quality management.

MEASURE 2. IMPROVING DATA LITERACY

1. **To create personalised information channels for different user groups.** An increasing need for information is associated with the expectation to receive information in a simple and clear format. In addition to classic and special databases, it is important to create dissemination channels for different user groups that include indicators relevant for them.
 - 1.1 In the new strategy period, Statistics Estonia will focus on developing personalised web-based governance dashboards for the main representatives of public interest, municipalities and professional associations. This requires an overhaul of Statistics Estonia's website and adoption of new electronic formats for the dissemination of statistics (e.g. videos, electronic paper, etc.).
 - 1.2 Important developments also concern the statistical database on .Stat platform. The new .Stat user interface, which is currently in development phase, is planned to be adopted in 2019. The new interface is flexible and modular, and corresponds to the requirements of modern user applications. One of the aims of the strategy period is also to adopt the IMF SDDS Plus standard by 2020. Estonia started to adhere to the IMF SDDS (Special Data Dissemination Standard) in 1998; in 2012, IMF developed a new improved standard SDDS Plus. According to the new standard, a website must be created that meets the new requirements and has data available in machine-readable SDMX format.
 - 1.3 Statistics Estonia will certainly not forget its research partners – a secure environment will be created that will give them convenient access to confidential data necessary for their research and analysis work. Statistics Estonia is weighing the option to realise it as a self-service environment, which would allow the user to design one's desktop as needed.
2. **To implement data mining and increase data mining competence.** As knowledge and resources are limited, there is a significantly increased expectation that it should be possible to order data mining and linking service from Statistics Estonia. Implementing data mining is necessary for studying new methodologies and phenomena. Statistics Estonia plans to increase data mining knowledge considerably in cooperation with partners (e.g. Center for Big Data Statistics in the Netherlands) and offer data mining service on commission (think tank service).
3. **To improve pre-release analysis competence.** For understanding various phenomena, it is necessary to cooperate more closely with the main representatives of public interest and professional associations. Statistics Estonia wishes to strengthen the dialogue between the private and the public sector, in order to ensure that indicators are understandable and adequately interpreted.
4. **To improve statistical and data literacy.** Assessing contemporary phenomena requires a clear understanding of data sources and assessment methodology as well as the skill to interpret the phenomenon through data. Statistics Estonia offers support to users in the form of meta information, methodology and data interpretation courses.
5. **To strengthen the capability of providing quick explanations to social phenomena.** Information society has given rise to the spread of fake news. For understanding social phenomena, it is more and more necessary to quickly offer statistics that would enable decision-makers and citizens to comprehend phenomena and make informed decisions. Statistics Estonia will prepare an activity plan for quick commentary and explanation of the topics debated in the society and ensure that it is up to date.
6. **To communicate success stories.** Statistics Estonia has made great strides in the areas of data collection and statistics dissemination. The institution is often presented as an example in Europe as well as elsewhere in the world. Statistics Estonia will take steps to ensure that its internationally supported innovative initiative will continue to be communicated around the world.

MEASURE 3. COORDINATING STATE DATA GOVERNANCE

1. **To create a data governance coordination team and promote responsibility for data governance and data governance activities in institutions.** The determining factor for the success of data governance is initiative and availability of specialists in institutions. The latter are also called data stewards. Coordination of the area by Statistics Estonia enables implementing common activity principles and standards, establishing directions and ensuring similar responsibility and activities in institutions.
2. **To coordinate data descriptions in the databases of the State Information System and other information systems used in statistics, promote semantic interoperability and manage the system of classifications.** Currently, the data descriptions in the Administration System for the State Information System (RIHA) do not provide the necessary information for better organisation of data governance, as they are either too general or too technical. There is a plan to make the descriptions more understandable for people working with content to allow them to promote once-only data collection. In order to improve the use of classifications, Statistics Estonia will continue to coordinate their use and will develop user applications in relevant areas.
3. **To develop a state meta information system.** One of the important questions in data governance is which metadata to use in descriptions for finding and understanding data, for ascertaining authenticity and reliability, etc. There is a plan to develop and adopt a meta information system that would fulfil the needs of different users and would allow consistent semantic development in the direction of artificial intelligence. First, domain dictionaries will be compiled. Statistics Estonia is the metadata competence centre for data description and will coordinate data description in the country. Statistics Estonia will monitor and develop the meta information system through international cooperation and based on international standards.
4. **To develop a national environment for overview of data architecture.** Besides the technological and structural architecture of information systems, Statistics Estonia places importance on constant overview of data architecture. Here, unstructured data (Big Data), which are also a source of statistics, play an increasingly bigger role. The current overview at database level is only partially satisfactory, as overview is often required at the level of information assets (incl. files, schemas) or services (interfaces, APIs). The purpose of this environment is that the data needed by users are easy to find and that it is closely connected to the meta information system.
5. **To develop a framework for identifying and improving data quality.** In statistics, the European Statistical System (ESS) process and output quality assessment methods are used, and Statistics Estonia is the competence centre for this. The objective is to develop assessment methods of data quality for institutions, and to implement these. Secondly, data quality is a topic that also concerns governance of state databases. Based on the work by the Ministry of Economic Affairs and Communications, a maturity model approach for monitoring data governance quality will be implemented.
6. **To measure administrative burden and use coordination to implement once-only principle in databases.** The principle of once-only data collection and multiple use increases the reliability of data collected once in the right way. The aim is to implement the concept of activity-based and user-based main data and use it for producing statistics. Developing data governance ability provides the opportunity to discover, analyse and avoid double collection of data in producing statistics and in meeting the objectives of other agencies, if the data already exist in a state database.
7. **To make preparations for a national data archive.** Currently and increasingly so, data are used in statistics that the National Archives have not deemed archive-worthy. There is a plan to evaluate data based on their retention period and implement their lifecycle management. It allows archiving (organising and describing) data at the right time or destroying data in a controlled manner that have lost their value and are no longer used. A new data archive would ensure long-term preservation of archived data and use of these data in statistics as well as in research.

MEASURE 4. ESTABLISHING DATA VIRTUALISATION SERVICE

1. **To describe the metadata of the data used in Statistics Estonia and integrate the use of metadata in information systems.** Standard descriptions of the metadata of statistical activities enables analysing and, where possible, standardising the processes and stages in various statistical activities. Standardised process components move along faster and require less resources. Standardisation of processes is a precondition for the efficient implementation and development of the information systems developed for the 2011 Population and Housing Census and the register-based census.
2. **To continue developing the data warehouse of Statistics Estonia.** The data warehouse contains the data collected and processed by Statistics Estonia in a systematised and described format. Further development of the data warehouse data model simplifies the reuse of data, allowing to combine and link the data in the data warehouse and, consequently, to produce necessary statistics quickly, i.e. to create completely new knowledge based on existing information. The development of the data warehouse includes also the creation of a notification gate of input data, data notification capacity (when the data have arrived) and a non-relational data warehouse (data lake).
3. **To create a system for monitoring the life cycle of data use (data lineage).** In order to offer the users of statistics reliable information as statistics and as data, it is important to develop a monitoring system for data lineage and linking of sources with final indicators in a way that is understandable for the users of statistics.
4. **To implement the use of a source database in all statistical activities.** The annual 150 statistical activities of Statistics Estonia are in many respects similar in terms of the used data sources and stages of data processing. One of the aims of Statistics Estonia is to reuse data warehouse and the data of prior data processing stages when producing source data.
5. **To offer a data use service (data virtualization).** Statistics Estonia considers it important to create one central virtual and safe environment for accessing the data descriptions of state databases and the corresponding metadata, and if the user has the relevant rights, accessing the data in modern data formats. Statistics Estonia is not planning to physically concentrate various data, but instead provide a single controlled access to database data via a single interface, adding the necessary meta information. This makes it possible for all stakeholders, from occasional users to researchers and analysts, to use controlled-access data for analysis, irrespective of their source of format.
6. **To offer data use measurement service.** The data use service ensures the possibility to log and analyse each data use case. Therefore, the data quality and metadata management is directed not at the entire data composition, but on currently used data compositions. This, in turn, allows databases to give feedback on data life cycle management (find data that are not used), review and optimise data collection and governance.
7. **To offer making direct identification of data impossible (i.e. anonymization).** Besides single access to data, different user groups (e.g. researchers, data analysts, Statistics Estonia's statisticians) require the possibility to link datasets quickly and conveniently. New data structures should be described at metadata level and data architects should validate the relevant data links. Confidential data according to use cases are pseudo-anonymised, which allows linking data for analysis purposes but not identify at individual or enterprise level.
8. **To offer an application programming interface (API) service in data submission.** For data use cases outside Statistics Estonia, a single API is needed, in order to ensure the implementation of the once-only principle in other information systems. Here, the most important activity is realising the next stages of Reporting 3.0 project.
9. **To create a single environment and API capability for statistical data.** Data virtualization allows solving the dispersed access problem of open data and make all data virtually available through a single service (data as a service). This has already been done elsewhere in the world, such as in New Zealand (Data Commons programme).

SUPPORT MEASURES AND MAIN AREAS OF ACTIVITY

The requirements for meeting Statistics Estonia's objectives are motivated and competent employees, more effective leadership and development of information systems.

MEASURE 5. BUILDING PARTNERSHIP

- 1. To build closer cooperation with key partners (main representatives of public interest).** Currently, Statistics Estonia cooperates with ministries primarily in assessing development plan results and impacts. Statistics Estonia has a detailed overview of different data and the skill to use data to explain social phenomena, therefore, it wishes to take part in creating development plans (incl. cooperation with analysts, meetings, research councils). Statistics Estonia will proactively offer partners different types of analyses, products and services based on their needs.
- 2. To coordinate a network of analysts.** For the analysis of different phenomena, Statistics Estonia will involve experts of relevant areas as well as other public and private sector institutions. In addition, Statistics Estonia will help to search for data experts outside Estonia.
- 3. To use researchers more in solving data mining tasks.** In cooperation with universities, Statistics Estonia will initiate projects and competitions and offer trainee positions, in order to introduce the world of data and the possibilities of statistics.
- 4. To cooperate at the international level.** Statistics Estonia belongs to the European Statistical System and participates regularly in the statistical cooperation of international organisations (OECD, etc.). International cooperation helps to insure the comparability of international indicators and the representation of Estonian interests in the analysis of demographic, social, environmental and economic phenomena.
- 5. To promote cooperation with data mining technology enterprises.** The area of data analysis develops very quickly. Statistics Estonia will create a network with strong technology partners, in order to learn about the newest trends and stay up to date.
- 6. To record the data of national scientific research.** State institutions and universities commission many scientific and applied research activities, the results of which are available with the commissioning institution. A register created at Statistics Estonia that would concentrate the data of research of national importance in the domains of social life, economy, environment and population would simplify integration (linking and associating) and reuse of data and would reduce the likelihood that the same data are collected multiple times. This, in turn, reduces administrative burden and costs. The National Audit Office indicated a need for a central research database in 2015.

MEASURE 6. INCREASING STAFF COMPETENCE

Statistics Estonia can achieve its strategic objectives only with competent and committed employees. The following activities are necessary for implementing the measure.

- 1. To improve management quality.** Statistics Estonia will review the roles and responsibilities of the management and coordinating positions. Competence models will be developed for lower level and middle management and managers will be regularly evaluated. Development opportunities will be offered to managers as needed, and their cooperation will be promoted. In order to ensure a next generation of managers, employees with management potential will be identified, in order to support their career planning and development.
- 2. To improve professional competence and technology skills of employees.** The skills models of important job categories in the institution will be described based on the Generic Statistical Business Process Model. Statistics Estonia will use the descriptions to develop a training system in the institution and will educate internal training providers in order to ensure an effective system. The development needs of employees will be identified through an effective system of annual reviews, and development opportunities will be offered.
- 3. To increase employee satisfaction and commitment.** Commitment can be increased through beneficial and effective internal communication. It is important that all employees receive important information on time. Statistics Estonia will regularly organise employee events and will recognise achievements. It will implement measures to retain work–life balance and promote sports and health. To measure employee satisfaction and commitment, employee satisfaction surveys will be conducted regularly.
- 4. To ensure a future generation.** Statistics Estonia will identify the main educational institutions and specialties with graduates that are best prepared for recruitment to the institution. Statistics Estonia communicates effectively with educational institutions, introduces traineeship opportunities and recruits trainees. There is a plan to develop an internal trainee programme that would provide a comprehensive overview of Statistics Estonia's work. It is necessary to identify trainee supervisors within the institution and offer them development opportunities.
- 5. To create internal career opportunities.** Statistics Estonia will create opportunities and an environment for employees where they can best apply their abilities and skills. Career opportunities within the institution are documented and employees are encouraged to participate in internal job competitions.
- 6. To create a competitive and fair remuneration system.** Statistics Estonia is planning to raise the salary level of the institution's important job categories to at least the median salary level of civil service. The remuneration system must be updated and a remuneration policy developed that takes into account a person's contribution; also the most important positions must be identified. Statistics Estonia will evaluate the fairness of salaries while reviewing job categories, and the evaluation serves as a basis for making salary decisions.
- 7. To modernise recruitment process.** Statistics Estonia will develop an employer brand and value proposition. In the design of job advertisements and recruitment channels, the target groups will be taken into account. Employees will be offered rotation opportunities within the institution (in civil service and with international partners).

MEASURE 7. DIGITALISING PRODUCTION SYSTEM

An important condition for implementing the new strategy are investments in information technology.

- 1. To replace the old production system on time with a new metadata-based production system.** Implementing a new production system is a precondition for making the production of statistics faster and establishing a new data warehouse. Therefore, this is a priority during the 2018–2022 strategy period, and in the first years its implementation will consume all of Statistics Estonia's development resources. The implementation is planned by stage of statistics production, from data collection to dissemination. How many statistical activities and how quickly can be transferred to the new system in each stage depends directly on additional investments.
- 2. To digitalise production.** With the implementation of new production systems, Statistics Estonia plans to describe the steps and responsible persons in particular stages of production and information flows between the different stages. This helps to identify potential duplication of activities, repetitions, interruptions and so-called vicious circles. For each remaining stage, it is weighed whether it can be entirely or at least partially digitalised.
- 3. To make production stages more efficient by integrating software.** In Statistics Estonia, there are currently over 30 types of software in use, including some that are technologically very outdated (16-bit architecture). Integrating this software is costly and sometimes impossible, considering the standards that were used for building these applications. In the implementation of the new production system, Statistics Estonia will try to reduce the number of software and integrate the remaining software.
- 4. To reduce licence costs.** Statistics Estonia follows general developments in the software world, where open source solutions are used increasingly instead of commercial software with high maintenance costs (Oracle vs Postgre, SAS vs R, etc.). By applying this principle, it is possible to save millions of euros in licence costs.
- 5. To implement, where possible, ready-made software in production stages.** The greatest risk associated with the new production system involves the amount of time needed for development work. Therefore, Statistics Estonia is weighing the option to adopt ready-made software modules, approved and certified by the statistical offices of other countries, in the components of the European Generic Statistical Business Process Model (GSBPM).
- 6. To adopt smart tools.** Modern artificial intelligence and machine learning tools enable automatizing business processes in a way that was not possible in the past. An example is automatic and self-learning algorithms, which allow doing data checks, or virtual customer service agents (chat bots), which can independently answer simple and more frequent questions on finding data of statistical activities.

RENEWING THE STRATEGY

With management coordination, Statistics Estonia updates the strategy and target levels of indicators, along with the budget and statistical programme, every year in September–October for the following year.

The heads of departments communicate the messages to employees during annual performance reviews. The specific job tasks are agreed upon and aims for the following year are set during the reviews. The aims detailed during the performance reviews and at department level are submitted to the management, and if necessary, the strategy is improved accordingly. At the same time, the look in the future is extended by at least one year.