The National Statistical Office

Chapter 05

National Statistical Office (NSO) is the leading producer of official statistics in a country and is responsible for coordinating all activities related to developing, producing, and disseminating official statistics in the national statistical system (NSS). This Chapter describes the main features of an NSO. It presents different management and organizational models for an NSO to best comply with its mandate and functions as the main producer of official statistics and coordinator of the NSS.

Table of Contents

5.1 Introduction

Official statistics are the responsibility of central governments in most countries. In most countries, the main tasks related to official statistics are entrusted to a specialized government agency, office, or institution with official statistics as its main or core function. The name of such an agency would typically reflect its function: common names are national statistical office (NSO), which is used in this Handbook, central statistical office (CSO), national statistical institute (NSI), national institute of statistics (NIS), central bureau of statistics (CBS), and shorter names linking the function and the country, such as Statistics Canada, Statistics Sweden etc.

Box 1: Mission statement, vision statement and values

A mission statement is a sentence or short paragraph that defines the existence of a business, non-profit, government organization, or any other entity. Mission statements get at the heart of why an organization exists, rather than how it exists. A mission statement articulates the organization's purpose both for those in the organization as well as for the public and other stakeholders. Some organizations prefer providing a vision statement. The difference is that a mission statement focuses on an organization's present state while a vision statement focuses on an organization's future. A mission statement answers the question "Who are we?" and the vision statement answers the question "Where are we going?". Finally, an organization's values statement highlights the organization's core principles and code of ethics. The organization's core values shape daily culture and establish standards of conduct against which actions and decisions can be assessed and philosophical ideals.

Mission, vision and values statements of NSOs reflect the core undertaking of an organization entrusted with developing, collecting, processing, analysing, and disseminating essential demographic, economic, social, and environmental statistics to supports public and private decision–making. For more information, *Annex 4 - Mission - Vision - Values Statements* provides a few examples of mission, vision and values statements of selected national statistical offices.

In the last few decades, the development of the NSOs in the various countries has many common traits, especially regarding its legal basis and main functions, but also shows many variations depending on the countries' administrative systems. Originally, most NSOs operated on the basis of legislation that was specific to each country. Following the development and adoption of the United Nations Fundamental Principles of Official Statistics, UNFPOS, since the early 1990s, the statistical legislation in a large number of

countries has come to be based on these principles. Thus, as an increasing number of countries adopted and applied the UNFPOS, the legal basis of national official statistics has converged to the extent that despite different national traditions and legal structures, statistical legislation in a great number of countries is quite similar in content.

The mandates and functions of the NSOs are normally spelt out in the statistical laws, as well as the scope of their operations, their obligations and rights, and their place within the national administrations. Acknowledging that there may be considerable differences between NSOs in different countries as regards size, technical infrastructure and capacity, the similarities in their roles, functions and main activities are much more pronounced and more important.

5.2 Characteristics of NSOs

Among the main characteristics of NSOs the world over are the following:

- **Main role**
  The role and obligations of NSOs are to provide the government and the society with statistical information. The UNFPOS describe this role as an integral part of the democratic processes of society.

- **Core function**
  The NSO is almost everywhere unique because it is the only government institution with official statistics as its core function. Furthermore, it is generally recommended that the activities of the NSO are restricted to the core function of producing and providing statistics and that the NSO does not engage in administrative or politically related activities. This is necessary for maintaining the integrity and neutrality of the statistics.

- **Main producer of official statistics**
  In most countries, the NSO is the main producer of official statistics but normally by no means the only producer. There are countries where more or less all official statistics are entrusted to the NSO, but it is much more common that other government agencies are engaged in official statistics alongside the NSO. Typically, these institutions, generally termed other producers of official statistics, are units of government departments/ministries that provide statistics on their special subject. Irrespective of the speciality of the producers, their activities in official statistics are all equally bound by the UNFPOS and by the statistical law of the country.

- **Leader and coordinator of official statistics**

  In many countries, the NSO has the function of leading and coordinating the national statistical system (NSS), composed of all producers of official statistics. The leadership function involves taking the initiative to ensure that the various institutions engaged in official statistics work together. Their combined statistical production covers all main fields and interests of society and caters to all main user needs for official statistics. Furthermore, the leadership and coordination role of the NSO involves ensuring that the different producers follow appropriate methods and procedures which is mainly understood as ensuring that the activities follow international recommendations on the application of standards, classifications, procedures, methods, concepts and definitions. The coordination role of the NSO also includes ensuring that the activities of the various producers are coordinated to avoid under coverage as well as undue overlaps in the provision of statistics and statistical services.

- **National representative and participant in international cooperation**

  In many countries, the NSO is the designated national representative in international statistical cooperation. This requires the NSO to be responsible for providing international organizations with comprehensive national data sets based on international recommendations and are fit for comparisons with those of other countries. The international role of the NSO also requires it to participate in or at least follow closely the work on developing official statistics carried out under the auspices of the international organizations in terms of extending and improving their coverage, quality, applicability, and usefulness. In some countries, participation in international cooperation is regarded as irrelevant, unimportant and a kind of luxurious activity. The reality is the direct opposite; international statistical cooperation is the most efficient way of informing the national statistical activities, providing the most modern knowledge, teaching the most relevant and modern methodologies, and making sure that the national statistics develop in harmony with those of neighbouring countries and do not stagnate and become irrelevant and of scant use.

- **Centre of knowledge**

  The central place of the NSO in official statistics of a country entails that the institution has to consider itself and act as a centre of knowledge of official statistics. This applies to knowledge of modern standards, procedures, methods, concepts and definitions and to development of new or extended statistics to cover emerging needs. It also involves knowledge of the principles on which the statistical operations are based, their content and application as well as the

restrictions and obligations they involve. These restrictions and obligations are mainly ethical in nature, in particular regarding the obligation to ensure confidentiality. Without a comprehensive knowledge of statistical procedures and principles, the NSOs would not be able to fulfil the requirements of the UN Fundamental Principle no. 2 of making decisions "according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage, and presentation of statistical data".

- **Legal basis**

  As discussed above, countries' statistical laws have become quite similar in coverage and content following the development and adoption of the UNFPOS. While the statistical law may focus on the NSO as the core institution of official statistics, the law encompasses all producers of official statistics irrespective of their place in the administrative structure. Typically, the statistical law would include main provisions on the following:

  - main principles of official statistics;

  - the organization of the NSO and place in the government administration;

  - the main function of the NSO to produce and provide statistics;

  - the mandate for data collection and for accessing data for the purposes of official statistics;

  - obligation to process statistics and disseminate the statistical outputs;

  - obligation to safeguard the data and ensure the confidentiality of individual data.

Statistical legislation issues are discussed in detail in *Chapter 3 - The Basis of Official Statistics*. For further guidance on statistical legislation see also *The Generic Law on Official Statistics, GLOS, UNECE 2015* (🔗).

5.3 National statistical office as an organization

5.3.1 Administrative structure and finance of the national statistical office

Administrative structure of the NSO

NSOs are organized in different ways, and their administrative solutions depend not only on the history, political and legal environment but also on specific national

circumstances of each country. The *Guidance on modernising statistical legislation (UNECE 2018)* (🔗) states that producers of official statistics should in principle, be distinct from the government and be organized as separate entities from other government departments. The Guidance describes three types of basic distinctions that differentiate statistical systems and in turn, influence the way an NSO is organized.

Centralized

Such as in Australia,Canada, or Mexico

Partially decentralized

Such as in the US and UK

Decentralised

Regionally

It distinguishes between centralised systems (such as in Australia, Canada, or Mexico), partially decentralized (such as in the US and UK) as well as regionally decentralised statistical systems.

The UNECE Guidance differentiates statistical systems in relation to reporting lines to the government. Although an NSO can be referred to as **'office', 'bureau', 'agency', 'institute', 'body' or 'authority'**, the administrative status varies from country to country, and the name is not helpful in determining the administrative status of the authority. In any event, an NSO should be a state body, and for issues that are not covered by professional independence, it may report either to the Government (directly to the Prime Minister or indirectly through a responsible Minister), to the Parliament (directly or through an appointed managerial body) or to the President of the country. Alternatively, it can report to a body (management board) appointed by the Government, Parliament, or the President – in which case it can be considered an autonomous (or semi-autonomous) agency.

The various administrative solutions have their respective advantages and disadvantages, and these can be related directly or indirectly to the following factors:

The legislative authority of the office:
Level of autonomy in drafting and proposing statistical laws and bylaws that regulate the whole statistical system

Budgetary autonomy:
Ability to reallocate the assigned funds within a budgetary year without external interference

Staffing:
The ability to hire the required staff without external administrative barriers, non-related to budgetary issues

Wages:
(Ability to pay competitive salaries to staff, i.e. IT or statistical experts)

Organization:
Ability to implement internal organization structure without external barriers

Any changes to the administrative status, particularly those enacted through the national statistical law, should be handled with care. The process of creating or amending the law can take considerable time and creates an opportunity for other actors to influence statistical legislation.
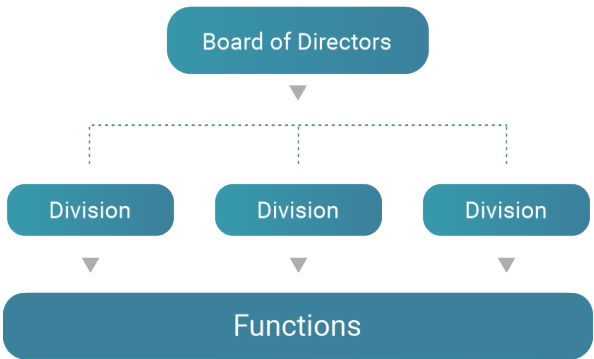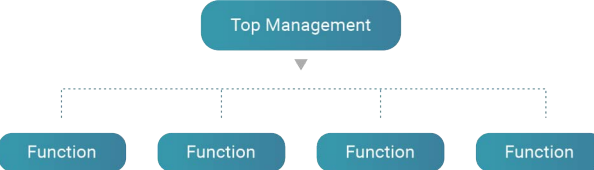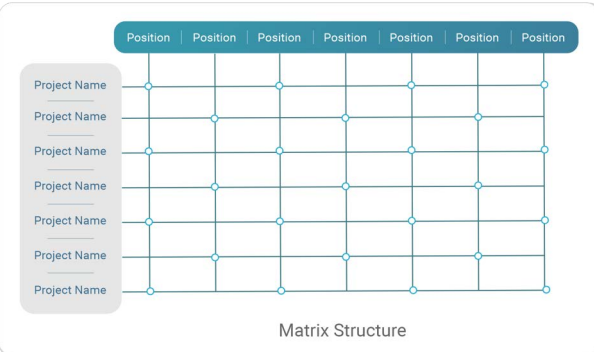
Amendments in the scope and range of activities within the NSS require a specific high-level policy decision by the central government and may even involve special legislation. Such a decision is not likely to be influenced entirely by the results of an objective analysis of the alternatives. Inevitably, past practices, interdepartmental rivalries, the structure and size of government, the impact of tradition and personalities, and so on come into play. Moreover, when possible changes in the organization of the NSS or the

NSO are considered, short-run disruptions in service caused by the change must be weighed against the long-run gains.

Organizing the NSO

NSOs have generally been organized either according to subject matter or function, but most commonly by combining the two approaches.

A review undertaken by the Turkish Statistical Institute under the auspices of the Conference of European Statisticians 2014/2015 classifies NSOs organizational structures into three most common basic types of organization (*In-depth review of process-oriented approach to statistical production*) (🔗):

Board of Directors Division — Division — Division Functions	**Divisional structure:** a division is a collection of functions which produce a specific product. The divisional structure or product structure consists of self-contained divisions. This type of structure is close to stovepipe structuring, where units are based on statistical domains, responsible for the production of a certain product.
Top Management Function — Function — Function — Function	**Functional structure:** in functional organizations, units are based on functions. In the case of NSOs, these functions could be specified as data collection, processing, dissemination, etc.
Position | Position | Position | Position | Position | Position | Position Project Name Project Name Project Name Project Name Project Name Project Name Project Name Matrix Structure	**Matrix structure:** this type of structure is a mix of functional and divisional organizational structure, with dual reporting lines.

The divisional structure - commonly referred to as stovepipes - commonly used in various parts of government administration may lead to inefficiencies. It should be

noted, however, that this approach has significant benefits. Communication from the Commission to the European Parliament and the *Council on the production method of EU statistics (COM (2009) 404 final)* (🔗):

The stovepipe model is the outcome of a long historical process in which statistics in individual domains have developed independently. It has several advantages: the production processes are best adapted to the corresponding products; it is flexible in that it can adapt quickly to relatively minor changes in the underlying phenomena that the data describe; it is under the control of the domain manager, and it results in low-risk business architecture, as a problem in one of the production processes should normally not affect the rest of the production.

The advantage of the stovepipe model is that it can create specialized substance knowledge developed and maintained in the team, thus leading to improved quality of statistics. On the other hand, a stovepipe model would inevitably lead to differences in quality, response burden and costs between statistical domains. The Commission communication also states:

However, the stovepipe model also has several disadvantages. First, it imposes an unnecessarily heavy burden on respondents. Given that data collection in different domains is done in an independent and uncoordinated manner, respondents are regularly asked for the same information more than once. Second, the stovepipe model is not well adapted to collect data on phenomena that cover multiple dimensions, such as globalisation or climate change. Finally, this way of production is highly inefficient and costly, as it does not make use of standardisation between areas and collaboration between Member States. Redundancies and duplication of work, be it in development, in production or in dissemination processes are unavoidable.

The most common interpretation of subject matter versus function leads on the one hand to the creation of divisions such as trade, industry, health and education, and on the other hand to functions such as sample survey design, data entry and data editing, field operations, quality, analysis and dissemination. From a production perspective, some functions can be grouped into agency-wide functional units, such as sample design and fieldwork. Other functions that generally require the direct involvement of a subject-matter specialist would be better placed with subject-matter units.

It should be well noted that data collection should be organized as efficiently as possible in order to minimise the burden, both, for the respondents and the collecting agency.

Statistical dissemination should be user-focused rather than based on statistical sources and processes.

The in-depth review of the process-oriented approach to statistical production mentioned above also stipulates that "Stovepipes and silos may exist no matter how the organization is structured. Therefore, looking for a structural solution for silos may not always be the right approach.

Creating bridges across silos, improving communication between departments and ensuring that they are working efficiently toward the same goals could be are more important than the structure of the organization.

If there is organization-wide encouragement to work well across divisions, then silos could disappear. In addition, process improvement and re-engineering also bring widespread change in the organization, and organizations move toward a matrix or process-based functioning."

Examples of simple re-engineering and taking steps towards a process-oriented organization can be found in many NSOs. It was noticed that due to seasonality in data collection, savings could be achieved by grouping data collection, editing and processing into dedicated units. Leaving them in the subject area organizational units can be inefficient and lead to excessive capacity during certain periods. For example, data collection in a certain monthly survey finishes around the 15th of each month, and data editing must be finished within the next 10 days. If data editing and processing are performed exclusively by the subject matter unit, this leads to the need for additional human resources, that are fully utilised only during the data processing phase. If the tasks within the data processing phase are performed in the data editing and/or processing unit, the workflow between various data collection processes can be distributed, and significant savings can be achieved. The most common argument against this is that processing outside of the subject unit would reduce quality. This could be remedied by the introduction of quality checks or by combining only similar types of processing.

Analytical frameworks such as national accounts and environmental accounts have been the driving force for introducing horizontal approach into NSOs.

National accounts produce a wide array of interlinked products, with varying deadlines. Therefore, organizing their production into a one-dimensional structure is often

inefficient and may lead to inconsistencies and interpersonal conflicts. A common way around this issue is to establish cross-domain committees, that can bridge and interconnect to mitigate the stovepipe impediments. National accounts departments organized according to the divisional approach may lead to stovepipes and suboptimal prioritisation. The focus of the work would naturally be on the improvement of individual products, rather than on an integrated approach that can lead to overall improvements in consistency and quality. By introducing a matrix organization, or by mimicking it with the introduction of product-related committees, production can be optimised for each domain while simultaneously enhancing coordination and increasing consistency (see *Chapter 9 - Analysis and Analytical Frameworks*).

Reorganizing the production process – the GSBPM

In view of the deficiencies of the stovepipe organization and production system, efforts have been made in the last few years to create a more functional system for the statistical production processes. A major milestone in these efforts was the development of the Generic Statistical Business Process Model (GSBPM). This model has been developed under the coordination of the Statistical Division of the UNECE in Geneva, based on innovative practices in a few leading NSOs. The GSBPM seeks to describe and guide the overall process of the statistical production as well as the individual production processes. The idea behind the GSBPM is that statistical production is better organised around functions than subject matters and that the same procedures can be utilised for the generation of several subject matter statistics. Thus, as an example, the same procedures for collecting data apply to several subject matter areas. Also, instead of designing and building specific methods and IT tools for each subject matter area, the idea is to build methods and tools for the different functions that can be utilised in many subject matter areas.

Figure 4: GSBPM

Overaching Process

Specify needs	Design	Build	Collect	Process	Analyse	Disseminate	Evaluate
1.1 Identity needs	2.1 Design outputs	3.1 Reuse or Build Collection Instruments	4.1 Create frame and select sample	5.1 Integrate data	6.1 Prepare draft outputs	7.1 Update output systems	8.1 Gather evaluation inputs
1.2 Consult and confirm needs	2.2 Design variables descriptions	3.2 Reuse or build collection instrument	4.2 Set up collection	5.2 Classify and code	6.2 Validate outputs	7.2 Produce dissemination products	8.2 Conduct evaluation
1.3 Establish output objectives	2.3 Design collection	3.3 Reuse or build dissemination components	4.3 Run collection	5.3 Review and validate	6.3 Interpret and explain outputs	7.3 Manage release of dissemination products	8.3 Agree an action plan
1.4 Identify concepts	2.4 Design frame and sample	3.4 Configure workflows	4.4 Finalise collection	5.4 Edit and impute	6.4 Apply disclosure control	7.4 Promote dissemination products	
1.5 Check data availablity	2.5 Design processing and analysis	3.5 Test production systems		5.5 Derive new variables and units	6.5 Finalise outputs	7.5 Manage user support	
1.6 Prepare and submit business case	2.6 Design production systems and workflow	3.6 Test statistical business process		5.6 Calculate weights			
		3.7 Finalise production systems		5.7 Calculate aggregates			
				5.8 Finalise data files			

The GSBPM provides a systematic overview of tasks and activities that need to be undertaken when converting input data into statistical information. Initial versions of the GSBPM were oriented mainly around survey collection, while the most recent revision (v.5.1) also reflects the business processes for administrative data, commercial Big Data, geospatial data and other data sources, as well as statistical products using mixed data sources such as national accounts. The creators of the GSBPM note that it should be applied and interpreted flexibly. It is not a rigid framework in which all steps must be

followed in a strict order. Instead, it identifies the possible steps in the statistical business process and the inter-dependencies between them.

GSBPM standardises process terminology. This allows an NSO to compare and benchmark processes within and between organizations. It can help identify synergies between processes in order to make informed decisions on systems architectures and organization of resources.

GSBPM is not a linear model – instead, it should be seen as a matrix through which there are many possible paths, including iterative loops within and between processes and sub-processes.

GSBPM contributes to a common vocabulary used within an NSO and between statistical organizations - having a standard terminology makes it much easier to communicate on collaboration projects. It can be used as a reference in planning, mapping, documentation and self-assessment of capacity needs.

The GSBPM identifies and describes eight phases of the overall statistical production process (**specify needs, design, build, collect, process, analyse, disseminate, and evaluate**) each of which is divided into sub-processes, sub-processes in all.
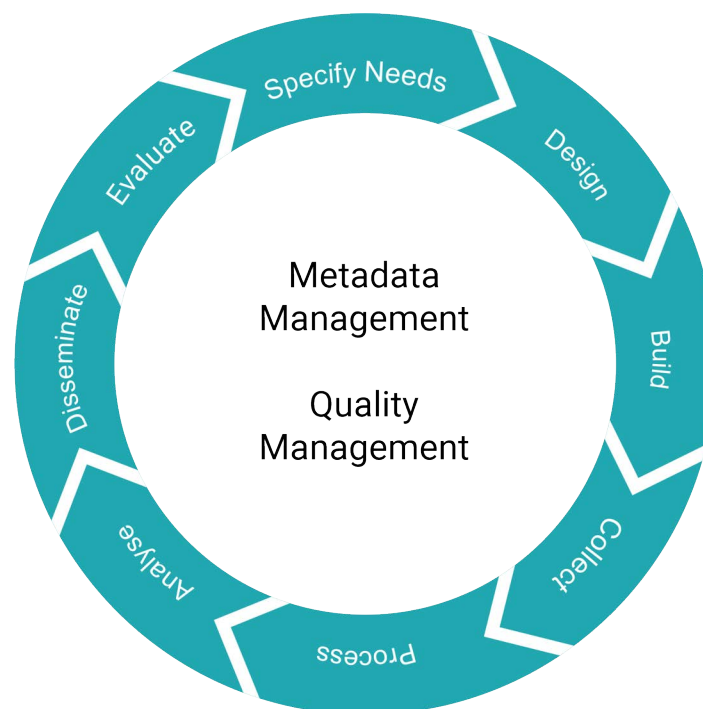
- ■ **Specify Needs** phase: The 'Specify Needs' phase is probably the most important phase of any statistical activity, as it is used to define the scope of data

collection activities and often transpose, vague demands into concrete plans. This is the phase of planning, identification of user needs, establishing research objectives, specifying information needs and consultation with the users. Investigation of concepts, data availability (such as administrative records) and practices in other countries are particularly important as they might prevent placing an unnecessary burden on respondents. This phase often requires direct involvement of the chief statistician, particularly during user consultations when it might be important to reduce the pressure of the users for collecting too many variables – which can reduce the quality of the results. It also includes the planning of survey stages and determining the role of administrative data. It ends with the approval or disapproval of the business case, usually done through appropriate sponsors and governance committees (see *Chapter 5.4.2 − Internal advisory and decision-making bodies*).

■ **Design** phase: The 'Design' phase describes the development and design activities, and any associated practical research work needed to define the statistical outputs, concepts, methodologies, collection instruments and operational processes. It determines the most appropriate collection method and generally includes all the design elements needed to define or refine the statistical products or services identified in the business case (IT, sampling, collection, dissemination…). This phase specifies all relevant metadata (including extractions from statistical, administrative, geospatial and other non-statistical registers and databases), ready for use later in the business process, as well as quality assurance procedures. Design activities make substantial use of international and national standards in order to reduce the length and cost of the design process and enhance the comparability and usability of outputs. Reuse and adaptation of design elements from existing processes are also encouraged. The 'Design' phase is a time of intensive inter-departmental cooperation - ideas must be turned into concrete plans and specialists for various processes have to be included.

■ **Build** phase: The 'Build' phase builds and tests the production solution to the point where it is completely ready for use. The outputs of the previous phase are assembled and configured to create a complete operational environment to run the process. Workflows are configured, routines and procedures are tested and documented. Pilot data collection is typically performed in this phase, and the training of users is performed. For statistical outputs produced regularly, this phase usually occurs for the first iteration, following a review or a change in methodology or technology, rather than for every iteration.

- **Collect** phase: The 'Collect' phase contains the collection of all necessary information, but also covers the preparatory processes that are intended to ensure that people, processes and technology are ready to collect the required data and metadata. It includes the creation of the frame and selection of sample, training of collection staff, ensuring the availability of collection instruments, providing information to respondents, minimizing non-response and loading the collected information into an environment suitable for processing. Depending on the geographical frame and the technology used, geo-coding may need to be done simultaneously with the collection of the data by using inputs from GPS systems, putting a mark on a map, etc.

- **Process** Phase: The 'Process' phase describes the processing of input data and their preparation for analysis. It is made up of sub-processes that integrate, classify, check, clean, and transform input data to be analysed and disseminated as statistical outputs. For statistical outputs produced regularly, this phase occurs in each iteration. The sub-processes in this phase can apply to data from both statistical and non-statistical sources (apart from sub-process 5.6 (Calculate weights), usually specific to survey data). The 'Process' and 'Analyse' phases can be iterative and parallel. Analysis can reveal a broader understanding of the data, making it apparent that additional processing is needed.

- **Analyse** Phase: In the 'Analyse' phase, statistical outputs are produced and examined in detail. It includes preparing statistical content (including commentary, technical notes, etc.), and ensuring outputs are 'fit for purpose' prior to dissemination to users. The preparation of maps, GIS outputs and geo-statistical services can be included to maximise the value and capacity to analyse the statistical information. This phase also includes the sub-processes and activities that enable statistical analysts to understand the data and the statistics produced. The outputs of this phase could also be used as an input to other sub-processes (e.g., analysis of new sources as input to the 'Design' phase). For statistical outputs produced regularly, this phase occurs in every iteration. The 'Analyse' phase and sub-processes are generic for all statistical outputs, regardless of how the data were sourced.

- **Disseminate** Phase: The 'Disseminate' phase manages the release of the statistical products to users. It includes all activities associated with assembling and releasing statistical products via different channels, such as formatting and loading information into output systems, preparing the product components (explanatory texts, tables, charts, maps, quality statements etc.), promotion and managing user support. These activities support users to access and use the

products released by the statistical organization. For more information see *Chapter 10 - Dissemination of Official Statistics*.

- ■ **Evaluate** Phase: The 'Evaluate' phase manages the evaluation of a specific instance in a statistical business process. It can take place at the end of the instance of the process but can also be done on an ongoing basis during the statistical production process. It relies on inputs gathered throughout the different phases. It includes evaluating the success of a specific instance of the statistical business process, drawing on a range of quantitative and qualitative inputs, and identifying and prioritising potential improvements.

See also *Chapter 14.4 — Use of standards and generic models in an NSO*.

5.3.2 Central office and regional network

Statistical systems vary from country to country. Some countries, particularly small ones, have an NSO, normally located in the capital city, operating on a country-wide basis. Many countries have the NSO headquarters located in the capital (in some countries the NSO head office is located in another city) and a network of regional offices controlled by the central office. In this form, the role of the regional offices is usually mainly to undertake and oversee data collection as prescribed by the central office. Coordination in such systems should proceed smoothly provided the central office has sufficient resources for training regional staff. (For an overview of Federal systems see *Chapter 4 - The National Statistical System*). There are examples of countries with a number of sub-ordinate offices, located in different regions of the country, that are specialized in particular statistics or subject matters. Thus, one such sub-ordinate or regional office may be responsible for the entire production process in a given subject or domain, such as labour market statistics (including conducting labour force surveys), environment statistics or health statistics.

Statistical systems vary considerably regarding the extent to which the official statistics are collected, processed and disseminated by the NSO or other producers of statistics.

This is referred to as having different degrees of functionally centralized or decentralized statistical systems (see further discussion in *Chapter 4 - The National Statistical System*).

Although many statistical processes have been redesigned as a result of the introduction of modern technology, some official statistics require or benefit from direct contact with respondents. Due to historical reasons, administrative arrangements and

territorial divisions often make regional presence mandatory or unavoidable. In the past, when data collection was done mainly via paper format, the regional presence was more or less unavoidable or at least preferable. The work process was commonly carried out in both the head office and the regional offices. Thus, the regional offices would be responsible for data collection, data entry, basic checks and data editing while the head office undertook the processing and analysis. With the introduction of online, electronic forms and automated transfer of data (machine to machine), the data entry phase was transferred to the respondent. Many quality checks and corrections are now performed by automated logical controls embedded into data collection systems, while the use of databases encourages central processing and preparation of data. This has led to the strengthening of the central office's role and responsibilities while reducing the importance and scope of work in the regional offices. The increasing use of administrative data for statistical purposes, replacing or augmenting survey data, has had a similar effect on reducing the need for regional offices. The use of computer-assisted telephone inquiries also reduces the need for regional presence.

Regional presence remains important in large countries and in large-scale data collection activities such as censuses and price collections for the compilation of the Consumer Price Index (CPI). Therefore, many NSOs have tried to find a way to redistribute tasks locally or to find new activities for staff employed in the regional offices. The most common example of new activities is the introduction of additional controls and quality checks of register information, such as validation of local unit information in the business register and for follow-up activities of business surveys, even those carried out through portals. For tasks such as telephone data collection, regional offices can perform additional checks or telephone reminders. In addition, some NSOs have transferred entire functions to be undertaken at the regional level, for example, Canada and France, where regional offices play a key role as dissemination centres. In Australia, the regional offices act as national centres for certain areas of statistics, for example, the office in Victoria (Melbourne) is responsible for the compilation and dissemination of statistics on the services sector for the entire country. The same system is applied in Poland. Regional offices often compile or disseminate regional statistics and thus have an important role in customer service.

The relationship of an NSO with regional bodies remains an important issue. Depending on the country's administrative arrangements, data collection or supplying of statistical information at the regional level might play an important role. This is discussed further in *Chapter 4 - The National Statistical System* concerning the division of responsibilities in federal states.

5.3.3 Finance of the NSO

Adequate funding of statistics is a key issue in sustained statistical capacity-building around the globe.

Even though it could appear that financing for official statistics is stable as regards the regular statistical programme of work, IT and other statistical infrastructures generally require significant investments in order to keep pace with modern technology and growing users' requirements.

Unfortunately, this is not always achievable through regular financing, and NSOs are encouraged to use large activities (such as population censuses) or external (project) financing (e.g. from international donors) to finance the system-wide infrastructure upgrades.

Internationally comparable official statistics are a public good that provides relevant information necessary for the functioning of a democratic society. Therefore, official statistics must be (directly or indirectly) funded from the government budget. The process of securing sufficient budgetary funding is country-specific, but there are many similarities. Although financing official statistics is often not a government priority, statistical offices have an advantage over other administrative bodies in that their programs are clear, transparent, systematic and are based on international cooperation, manuals and recommendations. This makes lobbying for funding easier, as the chief statistician and management of the office can provide persuasive arguments when requesting additional funding. Ideally, a statistical office should know exactly how much each statistical product costs (which can be achieved through cost-accounting) or at least provide a reasonable estimate. This approach also helps fight budget reductions, as an argument can be made that statistical activities need to be cut if a significant reduction of budgetary allocation is demanded. In addition, the process also generally involves ensuring political support for planned activities, which can be achieved through engagement with the user community, statistical council or personal engagement of the chief statistician.

The status of the NSO can have a significant impact on its position within the government budget. Some NSOs have a dedicated budget line, while for others the budget of the NSO is included in the budget of another government entity (ministry, parliament, the office of prime minister or general administration). The regular budgetary procedure is usually based on what was allocated in the previous year +/- a certain percentage, and therefore having a dedicated line may lead to more stable financing,

while having a joint line may lead to more frequent decreases and increases. In any event, the best way to secure additional funding is by introducing new specific activities.

Box 2: Statistics Australia successful bid for additional funding

In 2014, the Australian Bureau of Statistics presented a detailed plan for modernizing the Australian statistical system (🔗), arguing that the data landscape had changed and that it could not continue to produce high quality official statistics with decreasing budgets and outdated IT infrastructure. The Bureau outlined a detailed plan and managed to persuade the government to secure a significant increase in funding over the next 5 year-financial cycle (in total 257 million AUD – which is about 12% of ABS 5-year budget, excluding census). The plan included a procurement of new IT systems with significantly improved security features, improvements in administrative data acquisition and integration, web page redesign, improvement to metadata management, training of staff and new services.

Some NSOs are able to secure additional funding by selling more statistical products and services on the market, while in some countries this revenue goes to the national treasury and statistical offices cannot use it as part of their budget. Even though additional sources of funding can be used to finance various activities, public service organizations should not compete on the market and production of public goods should be publicly funded. However, NSOs are in possession of datasets not held by others. These datasets may be underused as NSOs do not have the resources to make all combinations and aggregations of data readily available. Many user needs are also so specific that it would not be acceptable to use public funds to compile statistics to serve a narrow user need. As NSOs are public organizations, chargeable services cannot produce profit. They can only cover the costs of the additional work and the required infrastructure, such as IT and staff training. Use of those resources should be transparent (see *Chapter 10.8 — Recovering dissemination costs*).

The NSO may provide statistical services to other government bodies, international organizations and the private sector. Such statistical services may include sample selection from a public register, data collection, weighting of survey results, aggregation and compilation, composite indicator creation, seasonal adjustment, drafting of metadata, advisory services, anonymisation of data, disclosure control, data linking, preparation of tables, analysis and others. However, some NSOs may not be motivated to perform these kinds of activities as their administrative systems do not allow retention of recovered costs.

Additional income can in some countries be secured through selling statistical "goods "defined as "self-contained arrays of quantitative information, with or without interpretation, which can be stored for future retrieval. The medium in which these arrays are recorded is immaterial." Such goods might include a yearbook of national accounts; a removable media with the standard industrial classification; and tables on exports and imports by commodity groupings, downloadable from a web site. Additionally, statistical goods might include applications that can be used by the government or the public or pre-prepared microdata for scientific purposes, accessible via encrypted and coded media, remote access or safe room access. Microdata access for scientific purposes might also, in some cases, include statistical services – such as data linking. (See *Chapter 10.5.3 − Microdata*. Pricing of statistical goods and services should be dealt with particular care as the main motive for putting a price on them should be recovering the costs for additional service and not on earning additional income.

5.4 Governance and leadership

5.4.1 Chief statistician

The chief statistician is the highest authority of the national statistical system (NSS) with respect to substantive statistical matters. The chief statistician is usually the head of the NSO. In some statistical systems (e.g., the UK) the chief statistician is the head of the National Statistical Authority, while in highly decentralised systems (such as the US) the chief statistician is the president of a coordinating body (such as the Statistical Policy Branch within the federal government's Office of Management and Budget). Although in some statistical systems it may be difficult to identify the chief statistician, it is usually the person who has the authority to represent the NSS internationally. The rest of this section will primarily refer to the chief statistician as the head of the NSO, but the text may also be useful for other institutional setups.

Responsibilities of the chief statistician:

The responsibilities of the chief statistician can be described in a number of ways. Common element 3.6 in *Chapter 4 of the UNECE (2018) Guidance on modernizing statistical legislation* describes the main responsibilities of the chief statistician as follows:

- The chief statistician shall lead the strategic development of official statistics, partnerships and stakeholder relations to enhance the value of official statistics.

- The chief statistician shall represent the NSS at the national and international levels and coordinate the international collaboration of the NSS.

- The chief statistician shall be responsible for the general management and development of the national statistical office and its staff, including its central and regional offices (if applicable), in full conformity with national legislation and professional independence.

- The chief statistician shall independently decide on the structure, use of resources, tasks, and staff appointment.

- The chief statistician shall decide on the content of the draft multi-annual and annual statistical programmes including the statistical outputs and the implementation reports in consultation with users of statistics and other producers of official statistics.

- The chief statistician may issue standards and guidelines to be applied across the NSS for the development, production, dissemination and communication of official statistics.

- The chief statistician may promote the use of the standards, classifications and terminology applied in official statistics and by respondents, to administrative data providers.

- The chief statistician shall facilitate the correct interpretation of statistics and is entitled to comment on the use and misuse of statistics.

Authority of the chief statistician

Responsibility for the functioning of an NSO lies with the chief statistician, and the Government shall not intervene with matters pertaining to the professional independence of the NSO.

The main responsibilities of the chief statistician can be divided into two segments - professional and coordinative. On both of these issues, the authority of the chief statistician should be enshrined in the law, reinforced by personal attitude and competences. The *Guidance on modernising statistical legislation* (🔗) states:

"the Head of the NSO should have the authority to take professional decisions (without any kind of interference), especially regarding the scope, content and frequency of data compiled, personnel management, management of the operations of the NSO, release of statistical information and press releases and direct communication with policymakers and authorities. The Head of the NSO should also be at the most senior official level in a country, they should be considered a peer by the heads of other government departments and should be included in any regular meetings of such officials in order to promote and enforce decisions;"
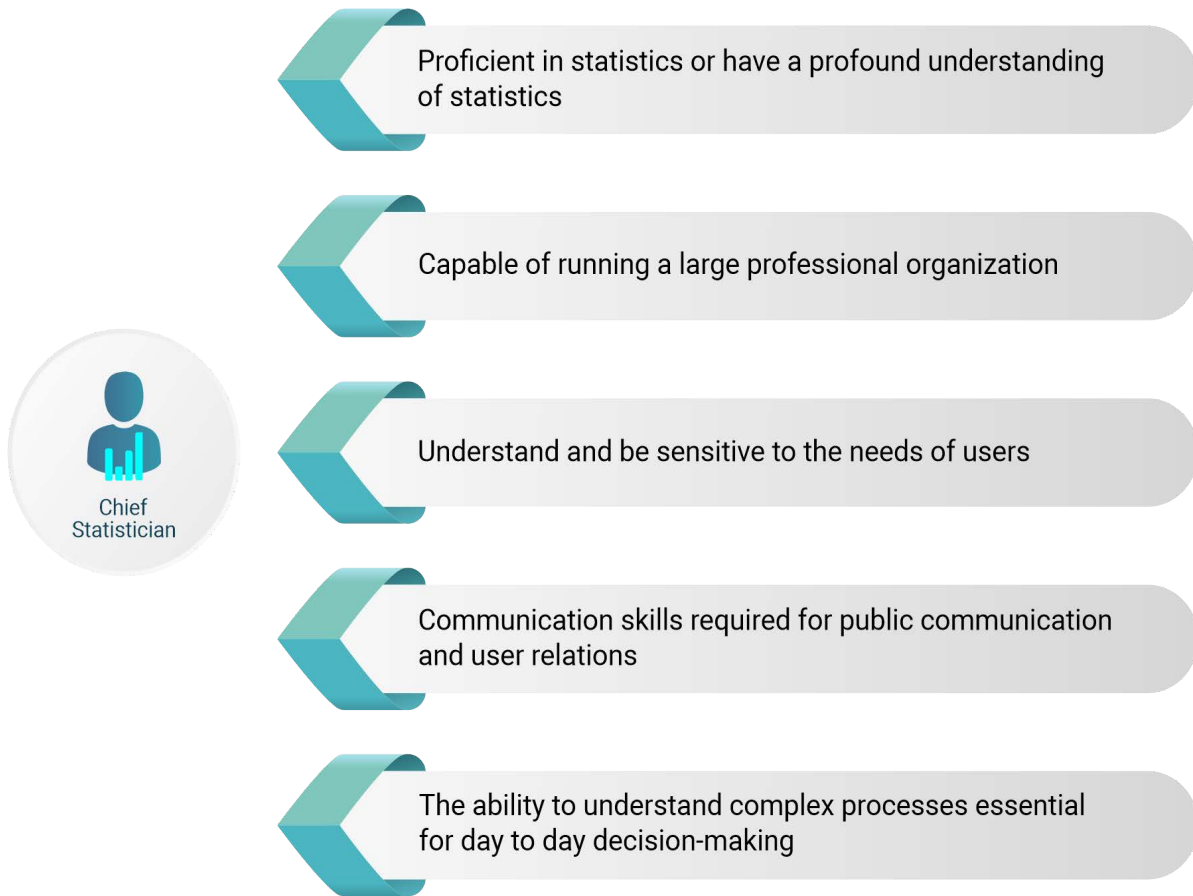
Further, the guidance states:

"Statistical legislation should clearly designate the coordination of the NSS to the chief statistician of the NSO or another statistical authority. Official statistics produced by different producers of official statistics all need to meet the same quality requirements, professional ethics and principles. The chief statistician should promote the use of internationally agreed statistical standards, definitions and classifications in the NSS and have the possibility to establish a national Code of Practice and put in place measures to support statistical authorities in applying the Code. The chief statistician should also be assigned the responsibility to represent the NSS internationally and coordinate international activities within the NSS."

Skills and qualifications of the chief statistician

A chief statistician should possess the following attributes:

Chief Statistician

Proficient in statistics or have a profound understanding of statistics

Capable of running a large professional organization

Understand and be sensitive to the needs of users

Communication skills required for public communication and user relations

The ability to understand complex processes essential for day to day decision-making

In terms of profession, chief statisticians are most commonly economists, statisticians and demographers with a proven track record of relevant professional experience. In recent years, data scientists, IT experts or other specialists as the chief statistician are becoming more common. Choosing a chief statistician is a difficult task, as the post requires a combination of skills that is not easy to find in one person.

A chief statistician is expected to provide expert opinion on many different subjects, and any gaps in expertise may diminish the perception of professionalism expected from an NSO. For these reasons, a wise chief statistician would rely on specialists who can provide helpful recommendations and consult them as much as possible. The job of the chief statistician is not only about professional competences. A successful chief statistician must also be a strategist who can recognise threats and opportunities, understand and address the problems of people working in the NSO and at the same time understand interests of the environment in which the NSO is functioning. Being professionally independent, the chief statistician should not be seen protecting the interests of the Government but servicing the user community at large – which is in the

interest of the state and the people. Therefore, another important qualification should be a clear sense of public good and behaviour in line with the Fundamental Principles of Official Statistics. In any debriefing on various options, the chief statistician must respond quickly at times and patiently at other times and must always demonstrate an enormous capacity to listen.

Appointment of the chief statistician:

The *Guidance on modernising statistical legislation* (🔗) identifies the appointment and dismissal procedures of the chief statistician as one of the most common weaknesses of current statistical legislation in countries. The Guidance states that:

> "The strong position of the Chief will enable compilation of statistics on an impartial basis and increases trust in official statistics. The chief statistician's appointment should be non-political and based on professional competence only. Deciding on issues of professional independence, such as data sources and statistical methods, requires specific professional experience and knowledge. The chief statistician's position should be filled following a published vacancy announcement with professional requirements and an open competition among applicants. Ideally, the position of chief statistician would not be part of mobility schemes in the public administration. In addition, the term of office of the Chief must be respected independently of changes in the government".

Many recent international efforts have tried to strengthen the appointment procedures of the chief statisticians. The *European Statistics Code of Practice* (🔗) in its 2017 revision includes indicator 1.8 which states:

> "the procedures for the recruitment and appointment of the heads of the National Statistical Institutes and Eurostat and, where appropriate, the statistical heads of other statistical authorities, are transparent and based on professional criteria only. The reasons on the basis of which the incumbency can be terminated are specified in the legal framework. These cannot include reasons compromising professional or scientific independence."

A similar formulation has been added to Article 5a of the *European Regulation on European statistics* (🔗) in its 2015 revision, which states under point 4:

"Member States shall ensure that the procedures for the recruitment and appointment of heads of NSIs[a] and, where appropriate, statistical heads of other national authorities producing European statistics, are transparent and based only on professional criteria. Those procedures shall ensure that the principle of equal opportunities is respected, in particular regarding gender. The reasons for dismissal of heads of NSIs or their transfer to another position shall not compromise professional independence."

a. NSI is abbreviation used in the EU to denominate National Statistical Institute, in this Handbook referred to as NSO.

A more detailed elaboration of the procedure that should be implemented in national statistical laws can be found in the article 6. of the *Generic Law on Official Statistics* (GLOS), and key characteristics for the appointment of a chief statistician should be the following:

- publicly announced vacancy and open competition based on relevant professional competences only;
- defined conditions for appointment (usually qualifications and years of experience);
- defined duration of the mandate and specified rules for extension;
- defined list of reasons for dismissal, as the term of office of the chief statistician cannot be terminated before its expiry for any reasons compromising statistical principles.

Terms of the office of the chief statistician

There are three standard variations related to terms of the office:

- The chief statistician's office term is the same as the **term of the government's executives** (this is the case with the chief statisticians in several countries in Latin America)
- The chief statistician is appointed for a **fixed term** of office that can be renewed (this is the case with the Government Statistician of New Zealand; the Commissioner of the Bureau of Labour Statistics of the United States; and the National Statistician of the United Kingdom Statistics Authority and the National Statistician of the Philippines).
- The chief statistician serves an **unlimited term**, which ends either with his/her resignation, retirement or removal from office or for other defined reasons (e.g. in case of the chief statistician of Canada, President of the Central Statistical Bureau of Latvia and in many countries in Asia-Pacific).

However, it should be noted that short terms of office interfere with continuity as statistical programmes tend to extend over significant periods of time. A series of chief statisticians may not share a common vision, and programme commitment could be unlikely to produce a consistent approach to statistical policy or predictably adapt to new circumstances. On the other hand, excessively long stays in office may produce stagnant programmes, lacking energy and innovation. While such a situation may keep the statistical organization out of potential conflicts, it may also marginalize the statistical organization and constrain its staff, eventually leading to reduced budgetary support.

The *Generic Law on Official Statistics* ([GLOS](#)) suggests that the chief statistician should be appointed for a term of office fixed in the statistical law for underlining professional independence and that the term of office should be different from the term of the government. The GLOS further suggest that the term of office should be renewed once and that it should be further renewed exclusively based on a new publicly announced vacancy and an open competition.

The GLOS also notes that the chief statistician should not be a member of the government and that the terms of office should be respected independently of changes in the government. However, the chief statistician would need to have direct access to ministers and other senior-level authorities in carrying out his duties.

Common element 3.5 in Chapter 4 of the UNECE (2018) Guidance on modernizing statistical legislation considers conditions for terminating the term of office of the chief statistician and states that the term of office cannot be terminated before its expiry for any reasons compromising statistical principles.

The term of office may be terminated only for the following reasons:

- own resignation of the chief statistician;
- termination of citizenship;
- a court decision declaring the chief statistician incapable or of limited capacity to work;
- a lawful sentence of the court for an intentional crime, or imprisonment according to the lawful sentence of the court;
- death of the chief statistician.

5.4.2 Internal advisory and decision-making bodies

An NSO is typically a relatively rather large public sector organization that produces a wide range of statistical products and services. Thus, management processes can be quite complex. To alleviate this, specific management and substantive bodies or committees may be established to promote cross-division and cross-domain exchange of information and the coordination and consultation processes needed to support decision-making within the statistical office.

Large NSOs, similar to other public administration organizations, generally have an internal management committee consisting of senior managers such as the chief statistician, who presides over the committee, deputy(s), chief of staff, executive secretary, heads of highest organizational levels and heads of independent units (if any).

Committee meetings are held regularly, on a weekly, monthly or bi-monthly basis, to discuss management, development and coordination issues. These meetings run according to a standard agenda with items such as reports on important activities at national and international levels, joint projects, major decisions, key administrative and management issues, and other issues. At these meetings, the chief statistician will delegate tasks, seek advice on management decisions and share important information. The agenda and minutes with decisions and action items should be made available to all staff. The tasks of the management committee vary depending on the size of the organization but are generally oriented around two types of issues – managerial and technical. Issues affecting only one organizational unit are usually discussed outside of these meetings, bilaterally with the chief statistician or at the level of main organizational units. In some cases, such as when the chief statistician is not responsible for the administrative management of the statistical office (e.g., Austria), managerial issues are addressed separately from the technical issues by different high-level committees.

Regular meetings at the level of main organizational unit chiefs encourage a focus on decisions related to subject matter issues, organization of work, development projects, upcoming changes or revisions, modernisation of specific activities, or preparing for the dissemination of new statistical products or services. Although it is not expected that the chief statistician attends this type of meeting, occasional attendance can provide in-depth insights and can be motivational to the staff. In addition to this, regular team meetings contribute to smooth and effective work. NSOs may also have some standing and ad-hoc committees to advise the chief statistician. These committees may deal with

cross-cutting issues such as statistical confidentiality and microdata access for scientific purposes, dissemination of special releases, modernisation of processes, quality management, coordination of work, among others.

Typically, internal committees are mandated by the chief statistician to provide advice in their area of competence. The committee needs a chairperson and when necessary, a secretary and terms of reference defining its objective, composition, expected outputs and timeline. The chair should be a person whose judgement is respected, even though his/her statements do not systematically carry the weight of an official decision. The committee's purpose is to advise the chief statistician. While the chief statistician has the power to ignore the committee's advice, in practice, and possibly with slight modifications, the committee's voice will be heard.

Committee membership offers an opportunity to contribute to agency-wide policies. Such activity can serve as a training ground for future senior managers in the sense that it provides members with a broader perspective than they could acquire from their regular jobs and makes them aware of the wide range of considerations important to the organization. Ideally, committees should not grow too large, or else they become cumbersome and incapable of reaching closure on the issues they debate. Generally, committee meetings and activities represent a heavy burden on their members' time. To maximize the training benefits that such committees confer on their members, some system of membership rotation could be adopted, but some stability is also required.

5.4.3 Internal communication and coordination

NSOs are usually relatively large organizations. In small countries, the NSOs tend to have lean management arrangements while the largest countries may have highly developed hierarchical structures. In large and complex offices, getting messages across can sometimes prove to be challenging. Hence, special efforts may be needed to strengthen two-way communication in larger statistical offices. Two-way communication involves feedback from the receiver to the sender instead of one-way communication which refers to sending a message without any feedback. Two-way communication may occur horizontally or vertically. When information is exchanged between superior and subordinate, it is known as vertical two-way communication.

On the other hand, when communication occurs between persons holding the same rank or position, it is called horizontal two-way communication. In effective organizations, communication flows not only downwards but also upwards and sideways in the organization. Before important decisions are made, prior two-way communication

ensures that staff are consulted to consider their ideas and concerns. After decisions are made, it is important that they are communicated effectively to staff. The chain of meetings is important for the effective functioning of an organization. Information should flow efficiently from the management committee to chiefs' meetings and further to team meetings, and also to the other direction to provide feedback.

While hierarchical structures have their benefits, without the direct engagement of the middle-management, they can lead to halts in communication and tensions between departments

It can thus be useful for the organization if the chief statistician can periodically take part in management meetings at lower organizational levels, particularly when a strategic topic has to be discussed. This can bridge the gap in communication and allow direct engagement on subject matters and problems that are not visible from the top of the hierarchy.

Another way of supporting this bottom-up flow of information is to ensure that minutes of chiefs' meetings, held even at team level, are made available, for instance through the intranet, to the entire staff including senior management and the chief statistician. Middle-and lower-management may sometimes consider meetings a waste of time; therefore, it is important not only to find the right topics to be addressed, but also adequate target participants, frequency, and duration.

Statistical offices frequently carry out activities that include multiple organizational units, and in such situations, tensions that arise as a result of misunderstanding are quite common. Usually, these can be resolved through firm involvement of the management, and if problems persist, an ad hoc body can be formed with the main task of proposing concrete solutions. Further, coordination can be fostered by using bodies set up for specific tasks, such as modernisation of specific activities through a project or preparation of large operations such as censuses.

Relationship with trade/staff unions and other staff committees

Fostering good relations and trust with trade and staff unions and representatives is important. These staff representative bodies are key to resolving staff issues, and it is critical, and in some countries even mandatory, to consult them before any major management decisions affecting staff, including changing the organizational structure. An important area where staff union's involvement can be expected is occupational health and safety, flexible working arrangements such as telecommuting, and other

issues related to work-life balance, motivation, and well-being that impact staff accountability and productivity. For all these reasons, the chief statistician needs a direct conduit to the staff, just as staff members need direct access to the NSO executive. This can be ensured by holding regular meetings with staff representatives, or, when relevant, staff unions. It is a good practice to have a staff representative participate in the management committee meetings. In some countries, it is obligatory to form a staff-management relations committee, where staff issues are regularly discussed. The committee's agenda depends partly on which elements are handled on a government-wide basis and left for each agency head to solve.

Elected staff representatives may also be affiliated to trade unions that commonly have their respective central offices providing support, analytics and legal advice to their members. Therefore, it is in the interest of the chief statistician to foster relations with trade unions (or trade union association) as they can advocate for and contribute to strengthening the statistical system.

Sharing of information and communication through the hierarchy and across the organizational structure

Regular exchange of information is a part of corporate culture that should be promoted and fostered since the success of any organization depends upon the sharing of information. This is particularly important for an information compiler such as a statistical office. Although modern technology can facilitate the exchange of information, traditional exchanges of information through formal meetings should not be underestimated. Direct interpersonal contact is the most effective means of two-way communication exchange. One way to ensure regular flow of information is to set up a meeting schedule and to encourage the organization units to make short minutes of the meetings and make them accessible on the intranet. The chief statistician should use these meetings to listen to directors, chiefs and experts to form a vision for developing the statistical system. The NSO and its management then share and discuss the vision and how to implement it and then further develop the ideas. On the other hand, some information, such as news regarding changes in the environment, i.e., regulations on civil service or accounting standards that may influence the office can be discussed at physical meetings, but also be communicated directly via e-mail, the intranet or newsletters. Exchange of best practices should also be encouraged, as solutions used in one statistical area can often be used to improve another. Unfortunately, due to silos and extensive workloads, it often happens that statisticians are not aware that there are specialists or practices from another unit who can help them solve their problem. More

information on knowledge sharing can be found in *Chapter 13 - Data, Information and Knowledge Management*.

Use of the intranet

In recent years, the intranet has become an essential part of any knowledge-driven organization. Typically, it is used to communicate basic staff related information such as the structure of the organization, a directory with office locations, email and telephone contacts, and collection of forms needed to perform administrative tasks and compliance with relevant legislation. But the intranet can and is often used to do much more. Currently, most statistical offices use it as a place for exchange of information, informal and formal discussions and for storing the minutes of meetings, sharing information on projects, international meetings and conferences, and exchanging relevant literature. Furthermore, the intranet can include "how to?" process instructions for various tasks, such as recruitment, project management and administrative tasks.

The advantage of the intranet is that information is searchable, and this allows this internal communication network to become a powerful tool for knowledge sharing and management.

The intranet can be customised to be used for many things, from blog posts on innovative practice, collaborative creation of documents to small applications that can be used to simplify bureaucratic procedures (i.e., travel forms). The key to building a good intranet site is to have a dedicated intranet administrator who can create engaging content and motivate others to do so by themselves. Ideally, each directorate should have its dedicated intranet page that is regularly updated with relevant information. Being well informed of current events and discussions in the statistical office, helps people get engaged in the work and contribute to development.

Development and communication of internal policies and decisions

Internal policies, procedures and guidelines can help ensure consistency of practices in an organization. In NSOs, they are most beneficial in standardising work processes, especially communications with users and respondents. Clear and transparent rules help standardise work and are essential for maintaining a good reputation and creating a strong brand for official statistics. Standardised approaches are particularly beneficial for organizations with a high turnover of staff, which is, unfortunately, becoming quite common due to relatively low salaries of statistical staff and the unique skillset of statisticians in demand by the private sector.

Most commonly, statistical offices have created a range of policy and guidance instruments, such as confidentiality policy and guidelines, data access policy, microdata access policy, pricing policy for tailored statistical services, press relations guidelines, government relations guidelines, dissemination and revision policy and many others.

Internal policies are usually the initiative of an employee, manager or chief statistician and are either created individually or through a dedicated working group or a standing committee. Policy creation through a working group or a committee is a good exercise for training and selecting future senior management as it requires a broad perspective and reaching a compromise with other members.

Signing an internal policy and posting it on the intranet is not enough to ensure that it is regularly enforced. Often, both soft and hard approaches are needed to ensure awareness and compliance. The chief statistician can address all employees in explaining the new policy, reasons behind its creation, and major changes, thanking the drafting team and linking to the intranet location where all internal policies can be found. This increases attention to new and existing policies, possibly leading to revising or updating some of them. On the other hand, enforcing the application of policies is not an easy task and the person who has to remind staff of their existence and ensure compliance will certainly not be the most popular person in the office. Enforcing compliance should be ensured by the responsible directors and chiefs as part of their regular management and decision-making tasks. As this is often an uphill battle, frequent reminders from the management and the chief statistician can be quite beneficial.

In recent years NSOs have become increasingly aware of the need to be transparent with respect to both their data providers and users. Many NSOs have partly responded to this need by posting key policy documents and guidelines on their websites. Nowadays, this is encouraged internationally as standard good practice. The thinking behind this is that there are no secrets in the statistical operations and processes and that increasing information to respondents and users is likely to enhance relationships with them, improve the NSO's data sources, and the use the statistical outputs.

5.4.4 Role of the national statistical office in planning monitoring and coordination

While the purpose, coverage, process and content of multiannual and annual planning, priority setting and monitoring was discussed in *Chapter 4 - The National Statistical*

System, this section will focus on the role and specificities of the NSO in those processes but also refer to the coordinative role of the NSO and its relevance to the whole NSS.

Apart from being the leading national statistical agencies, most NSOs are at the same time coordinators of the NSS and as such are expected to coordinate and lead the planning processes for the whole NSS.

Most commonly, statistical programmes are prepared by the NSO while other national producers of official statistics provide inputs to the programme or prepare their parts, as guided by the NSO. Preparation of the programme is usually organized through a dedicated unit within the NSO that coordinates the process, seeks inputs from both inside and outside of the NSO, filters and analyses those inputs and converts them into realistic and well-documented plans. These units are often also tasked with monitoring the implementation of statistical activities throughout the whole NSS, and often deal with other strategic issues, such as analysis of user requirements (see *Chapter 6 - Users and their Needs*), consultation with stakeholders and evaluation of plans and performance. Strategic planning units should also be involved in cost accounting and other similar exercises that provide estimates of costs for each statistical activity (if they are performed in NSOs). It is a good practice that such estimates are included into strategic plans.

An essential role of the NSO is the promotion of common practices across the NSS. This can be achieved by promoting cooperation and including representatives of other producers of official statistics, when possible, into relevant committees, working groups, task forces and other advisory bodies.

An example that can be used to improve cooperation within NSS and strengthen the coordinative role of the NSO is the formation of the National Committee of producers of official statistics[1] (as mentioned in the *Guidance on modernising statistical legislation, UNCE 2018* (🔗). This committee can transform and adapt policies and guidelines based on international recommendations that are used within the NSO into national policies and guidelines that aim to ensure quality in the development, production, and dissemination of all statistics produced by the NSS. Furthermore, producer committees at operational levels should be established in different statistical domains to promote

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1. Different NSSs have different names for this committee (i.e. coordination committee, NSS committee, interagency committees...) but its main purpose should be to promote and encourage coordination in the NSS.

ⓘ Links to guidelines, best practices and examples:

cooperation, reuse data, and standardise practices within the NSS. Units that are tasked with the preparation of strategic documents often serve as the secretariat for such committees. Cooperation within the NSS should be actively maintained and developed, and the task and obligation of the NSO is to promote and ensure cooperation with (and among) other producers of official statistics. Ensuring cooperation is not only a matter of capacity (which may vary quite considerably among the producers of official statistics) but also specialised knowledge and access to sector-specific information. Strengthening the coordination function of the NSO is also important for facilitating the verification and production of indicators needed for monitoring the progress towards Sustainable Development Goals.

NSOs and other producers of official statistics are government-financed institutions and as such are expected to be transparent and cost-effective in terms of the use of resources. Procedures aimed at monitoring and measuring the use of human and financial resources should be put in place to promote cost-effectiveness. Some statistical offices have set up systems that link statistical activities with the cost they have incurred through accounting and records of working hours (cost accounting systems) and through them can provide precise estimates of costs for each statistical activity. This type of information provides valuable insights into the allocation of budgets and helps with prioritisation and evaluation of plans and performance.

- The PARIS21 Advanced Data Planning Tool ([ADAPT](#)) is a free cloud-based tool for NSOs and other data producers that can be used to adapt their data production according to the data needs of policymakers and to adjust their existing data plans to any changes in priorities.

- The UNITAR [StaTact](#) tool was developed in partnership with the UN Statistics Division to enable countries to address measurement gaps that impede monitoring national policies and resolve problems tactically. It provides an analytical framework and a multi-stakeholder methodology to enable national experts from national statistical offices, concerned Ministries and other parts of the data community, including non-traditional data sources, to design a short-term action plan with a focus on addressing institutional impediments to data collection, production and utilization.

5.5 Statistical Business Architecture

5.5.1 Definition of a Statistical Business Architecture

A statistical business architecture covers all of the activities undertaken by an NSO to conceptualize, design, build and maintain information and application resources used in the production of statistical outputs. It is a formalized collection of practices, information, and tools to assess and implement business design and business change.

The statistical business architecture defines what the statistics "industry" does and how it is done.

It consists of the information, application and technology architectures for a statistical organization. The information architecture describes the information, its flows and uses across the organization, and how that information is managed; the application architecture describes the set of practices used to select, define or design software components and their relationships. The technology architecture describes the infrastructure technology underlying and supporting the information and application architectures.

5.5.2 The need for a Statistical Business Architecture

A statistical business architecture is needed to drive the information, application and technology architecture for an NSO. It is a critical input to IT planning, technology architecture, and business solution delivery.

Business architectures focus on business processes, and business uses cases, which are prerequisites to delivering an IT business solution. Therefore, the business architecture must reflect the entire business design from the business itself rather than that of the IT solution.

Business architecture represents a bridging function between the enterprise architecture level and the operational level and supports an integrated and ordered implementation of all the innovations necessary for any modernisation process.

The statistical business landscape can change rapidly, as in any other business. To stay relevant during such changes, the business needs to adopt a new model that allows it to adapt accordingly – and for this, agile business architecture is needed.

The agile method is a particular approach to project management utilized in software development and allows organizations to respond to the unpredictability of developing software solutions. It uses incremental, iterative work sequences that are commonly known as sprints.

The agile model uses assessments to determine what capabilities are available in the organization, identifies what is needed to pull the appropriately skilled staff, processes, and technology together. It uses small experiments to promote quick learning and allows an organization to quickly adapt through decentralized decision making.

(!) Links to guidelines, best practices and examples:

- *A Business Architecture framework for industrialisation and standardisation in a modern National Statistical Institute* (🔗).

5.5.3 The Common Statistical Production Architecture

Business architecture includes elements of the information, application and technology architectures.

The *Common Statistical Production Architecture (CSPA)* provides a reference architecture for statistical organizations.

CSPA has been developed in recent years by the international statistical community under the auspices of the High-Level Group for the Modernisation of Official Statistics (HLG-MOS).

CSPA is a framework for developing statistical processing components reusable across projects, platforms and organizations - it is often referred to as 'plug and play'. A formally defined business architecture can reference CSPA.

CSPA is covered in more detail in *Chapter 14.2.12 — Common Statistical Production Architecture (CSPA)*.

(!) Links to guidelines, best practices and examples:

- Definition of a business architecture (🔗) from HLG-MOS.

5.5.4 The Generic Activity Model for Statistical Organizations

The Generic Activity Model for Statistical Organizations (GAMSO) is the model covering activities at the highest level of the statistics organization. It describes and defines the activities that take place within a typical organization that produces official statistics.

Strategy and Leadership		
Define vision	Govern and Lead	Manage Strategic Collaboration and Cooperation

Capability Development		Corporate Support				
Plan Capability Improvements	Monitor Capability Improvements	Manage Business Performance and Legislation	Manage Quality	Manage Consumers	Manage Finances	Managee IT
Develop Capability Improvements	Transfer Support of Capability Improvements	Manage Statistical Manage Methodology	Manage Information and Knowledge	Manage Data Suppliers	Manage Humans Resources	Manage Buildings and Physical Space

Production
Generic Statistical Business Process Model

GAMSO was launched in 2015 and extends and complements the Generic Statistical Business Process Model (GSBPM) by describing overarching and cross-cutting activities that are needed to support statistical production. It is part of the common vocabulary of collaboration.

The GAMSO standard covers four broad areas of activity within an NSO: production; strategy and leadership; capability management; and corporate support. As with related international standards, GAMSO contributes towards creating a common vocabulary for these activities and a framework to support international collaboration activities, particularly in the field of modernisation. It can be used as a basis for resource planning within an NSO. GAMSO can contribute to the development and implementation of enterprise architectures, including components such as capability architectures, and also support risk management systems.

GAMSO is also covered in *Chapter 14.4.2 – Generic Activity Model for Statistical Organizations (GAMSO)*.

(!) Links to guidelines, best practices and examples:

■ A description of the GAMSO (🔗) and how it relates to other key standards for statistical modernisation.

5.5.5 Definition of an integrated production system

In recent years, many NSOs have initiated developments to restructure their statistical production processes, improve efficiency, and produce outputs that better satisfy user needs. These developments manage the evolution from the classic insular 'silo' approach, where specific domains have their own customised processes and architecture to a more integrated and modular approach where processes are shared and reused.

An integrated production system is an IT environment that can support the whole statistical data production cycle as defined by the GSBPM and meet the requirements of a large part of the various statistical surveys maintained by an NSO.

An integrated system enables an NSO to transition from a fragmented stove-pipe oriented production with specific systems for each domain, to the modern generic and standardised statistical production environment. A fully integrated system uses applications and processes that use standards and metadata to talk to each other in order to make the whole production cycle less burdensome, easier to manage and less expensive to operate.

5.5.6 Importance of an integrated production system

There are a number of reasons for an NSO to adopt an integrated production approach.

An integrated production system can help reduce the time, cost, and risk-related barriers for implementing innovations in statistical production processes by working in a more efficient and optimised way. NSOs constantly need to improve the production of statistical information and its quality, while simultaneously reducing both the total cost for its production and the respondent burden.

In a silo-based production system, each specific domain has its own set of custom processes that lead to duplication of effort and other inefficiencies. There is often a lack of common terminology and understanding across applications and a lack of process-orientation. Because of these differences, such production systems are difficult to

modernise and automate, and it is difficult to reuse information, methods, and technology. Together these difficulties result in a lengthy time-to-market for new statistical products.

An integrated production system involves the development and application of common methods and information technologies. This approach leaves freedom of choice in regard to underlying technologies and is a key enabler for collaborating, sharing and the flexible re-use of IT components within individual agencies and across the community of producers of official statistics as a whole: new statistical production processes can be assembled by selecting and configuring existing modules (also more widely known as 'plug and play') in using whatever applications (or parts thereof) that best respond to their particular requirements.

Applying such a modular approach allows and encourages NSOs to reuse and integrate existing statistical data and metadata to deliver new products and services. Managing new developments through a robust, flexible and stable platform can in turn, facilitate the greater automation of statistical production processes, thus leading to reduced production costs, easier maintenance and less expensive development.

(!) Links to guidelines, best practices and examples:

- Example from Slovenia NSO of transition from stove-pipe oriented production to an integrated processing system (⊖).

- Example from Korea NSO of the development of a generic Statistical Information System (⊖).

- Example from Statistics South Africa of using innovative technologies for statistical production (⊖).

5.5.7 Project management approaches

In any given NSO, there will almost always be several projects relating to methodological development of statistics and modernisation of production processes and systems. Depending on the methods used and the scale of a given project, several different project management strategies and methodologies can be adopted. Some of the most widely used and emerging approaches are described below.
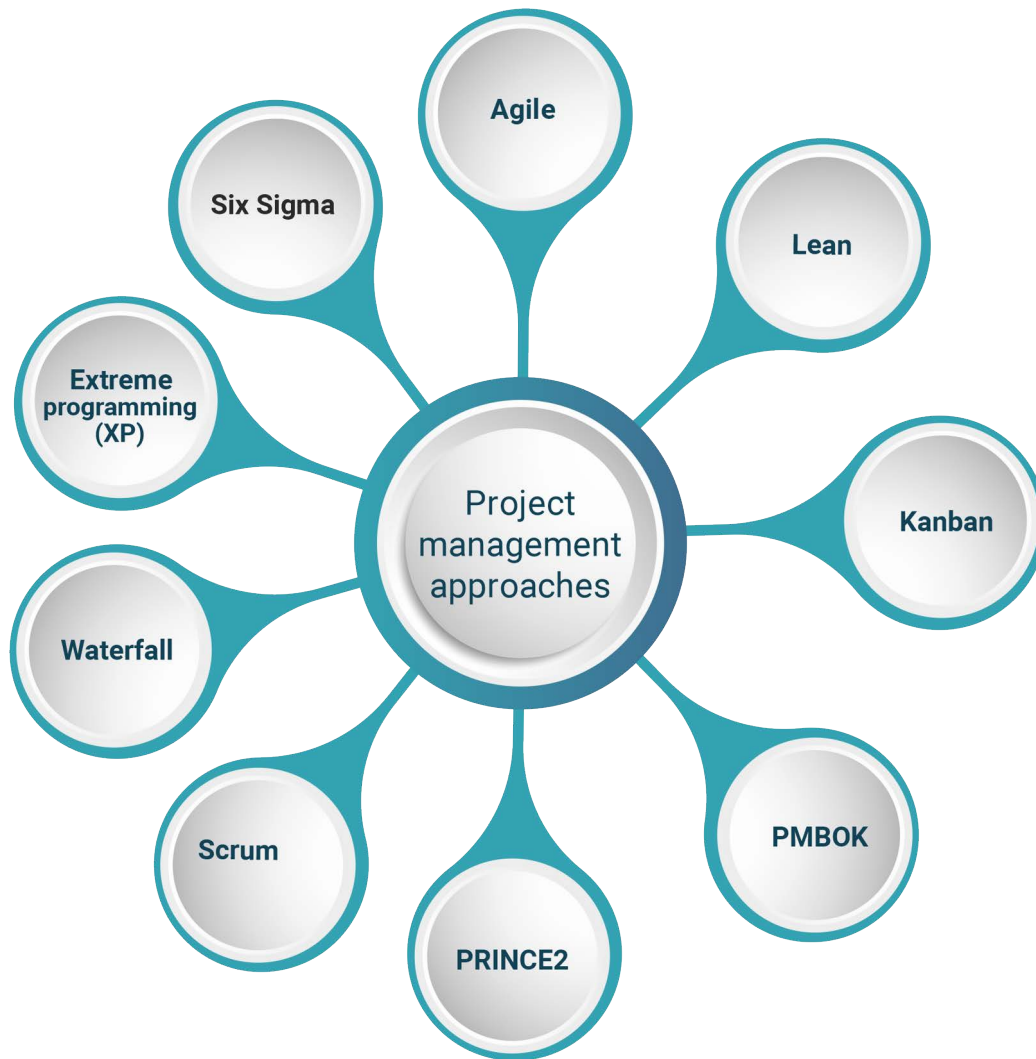
- [Agile project management](#) is based on a set of principles and consists of a flexible, iterative design and building process. Agile projects are characterized by a series of conceived, executed, and adapted tasks as the situation demands, rather than by a pre-planned process. This helps project teams respond to unpredictability through incremental, iterative work processes and a cycle of planning, executing, and evaluating as they go along. Agile methodologies emphasize adaptability to changing situations and the potential for changing or evolving requirements, such as software and game development.

- [Lean](#) is a project management methodology focused on efficiency and eradicating inefficiency by removing anything from the process that is not conclusively adding value to the client. Lean originated in manufacturing to eliminate waste and inefficiency, but its principles can be applied to any process. Examples of waste are defined as excessive documentation, planning and control, unproductive meetings and overly detailed requirements.

- **Kanban** is a project management methodology based on lean principles with a focus on releasing early and often with a collaborative and self-managing team. It is fitted for operational or maintenance environments where priorities can change frequently. Kanban is well-suited to work that requires steady output, like production or support and maintenance.

- **PMBOK** (Project Management Body of Knowledge) is a reference guide for project managers covering a set of standards which refer to the five process steps of initiating, planning, executing, controlling, and closing a project. PMBOK is a framework of standards, conventions, processes, best practices, terminologies, and guidelines recognised as standards within the project management industry. PMBOK is formulated around processes that coincide and impact each other to complete a project.

- **PRINCE2** (Projects IN Controlled Environments) is a well-established process-oriented project management methodology. It divides projects into multiple stages, each with their own plans and processes to follow. PRINCE2 defines inputs and outputs for every stage of a project and stresses the business motives such as identifying a clear need for the project, target customers, benefits, and cost assessment. A project board owns the project and is responsible for its success. This board defines the structures for the team, while a project manager oversees the lower-level day-to-day activities. This methodology gives teams greater control of resources and the ability to mitigate risk effectively. PRINCE2 is widely used for large scale IT projects.

- **Scrum** is a project management process which proposes principles and processes to improve delivery. It is one of many agile processes and aims to improve communication, teamwork and speed of development. Scrum is considered a light approach to project management and defines a simple set of roles, meetings, and tools to deliver outputs iteratively and incrementally. It recommends using small, cross-functional teams working on a collection of requirements ('user stories') that have been defined and prioritized by a product owner. Work is divided into 'sprints', a development cycle of usually 2-4 weeks, during which, daily 'scrums' take place where the team report on progress and obstacles.

- **Waterfall** is a project management methodology where work is planned extensively upfront and then executed, in strict sequence, adhering to requirements, to deliver the project in a single cycle. Requirements are defined in full before any work starts. Project tasks cascade through subsequent phases of

the project each phase must be completed before the next phase can begin and there is no overlapping in the phases, and the outcome of one phase acts as the input for the next phase. In a waterfall approach, a project will flow through the process from requirements, through design, implementation, testing and into maintenance. Once a project plan is approved, there is little flexibility to make any changes.

- Extreme programming ([XP](#)) is a software development project management methodology which defines values and processes to improve software quality and ensure responsiveness to evolving customer requirements. As a type of agile software development, it advocates frequent "releases" in short development cycles intended to improve productivity. XP includes elements such as programming in pairs, extensive code reviews, unit testing of all code, a flat management structure, expecting changes in the customer's requirements and frequent communication with the customer and among programmers.

- [Six Sigma](#) methodology focuses on understanding customers' requirements better and eliminating defects and waste. These objectives are achieved through in-depth knowledge of statistics, engineering, project management, and the underlying processes and systems. Six Sigma aims to identify and remove the causes of defects via a set of quality management methods, which use both empirical and statistical approaches – unlike in other methodologies data and statistics are the basis of decision-making rather than assumptions or guesses.

5.6 Change management

All NSOs have to deal with change. Change involves an organization moving from its current state to some desired future state. Modern demands towards statistical offices require them to implement changes almost constantly if they are to remain competitive. Change management provides a systematic approach to dealing with such transformations within an organization. These transformations cover strategic objectives, processes and technology and change management consists of a number of formal procedures to help plan and control change and staff to adapt to change. An effective change management strategy needs to focus on the human behaviour element.

Resisting change is a natural reaction when those affected by the change are not involved in the process. Staff resistance can have a significant negative impact on the short- and long-term success of a business improvement project. Resistance is a very normal part of change management, but it can threaten the success of a project. Most

resistance occurs due to a fear of the unknown risk associated with change – hence the importance of involving all concerned staff in any change process.

Change management should start at the top management level and ensure the involvement of all staff who are concerned. Senior management should be seen to be involved and committed to the changes and to communicate this clearly and regularly. A clear business case should be presented to stakeholders at all levels both within and outside the NSO as all stakeholders have different expectations, and there must be a high level of buy-in across the spectrum.

Good communication is vital. The goals and objectives of the changes should be clearly identified as well as issues to be improved as a result. It is critical to identify the focus and to clarify goals.

Change needs good planning to put it in place. This involves outlining the project roadmap using clear steps with measurable targets, incentives and measurements.

5.7 Risk management

Risk management is the process of identifying, assessing and controlling disruption during periods of change to an organization.

Actions in the context of risk management undertaken by NSOs are based on well-established theoretical and practical knowledge. The objective of these activities is to develop, implement and then improve the system of identification and response to emerging threats.

Agile risk management is an emerging methodology using an evolutionary set of measures to build a model combining the need to obtain a stable and predictable response system to emerging threats with a constant need to identify and exploit new opportunities.

(!) Links to guidelines, best practices and examples:

- *Guidelines on Risk Management Practices in Statistical Organizations* (🔗).