Appendix #2 to the Order #... by the Chairman, NSO, dated Dec ..., 2017

DRAFT GUIDELINES TO MODEL BUSINESS PROCESSES OF STATISTICAL DOMAINS AS PER THE GSBPM - MONGOLIA

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1. Executive Summary

The Generic Statistical Business Process Model (GSBPM) displays the framework of processes required to produce statistics. The model allows national statistical institutes to align their activities to common international principles, and it is a description of operational standardized and unified terms to help mutual exchange of experience in terms of approaches and methods. The GSBPM will be used for documenting the processes of producing statistics, coordinating infrastructure, ensuring the coordination of data and metadata standards, introducing and evaluating the quality management system in processes, and evaluating and improving quality etc.

In 2017, the National Statistics Office of Mongolia (NSO) developed "The National Strategy for Development of Statistics for 2017-2020" and it was discussed and approved by the Parliament of Mongolia. It states "To develop and implement the integrated standard of the general model of official statistical output and production (Generic Statistical Business Process Model - GSBPM)" in Section 2.2.9.1 of the activities for the implementation of the objective, Item 2.2.9 states "A quality management system will be introduced at all phases of products and services", in objective set forth in Article 2.2 of the Program, states "To develop statistical infrastructure aimed at supporting sustainable statistical business processes".

As part of the World Bank's "Smart Government" project, the NSO defined that the Generic Statistical Business Process Model (GSBPM) will be used as the basic statistical business process model in order to modernize the system of data creation and capacity building.

Moreover, it is specified in section 167 "To introduce the Generic Statistical Business Process Model (GSBPM)" and in section 168 "To cooperate with a domestic consultant in development of manuals and instructions for the Statistical Business Process Model of Mongolia (SBPM)", in Implementation Activities of Sub-Objective 4.1, Objective 4: "To introduce cost-effective and advanced technologies compatible with each phase of statistical business process, and build a general model of statistical outputs and productions" of the action plan for 2017 of the National Statistics Committee on "Introducing Advanced Information Technology".

According to the above justification and requirements, in order to model the statistical business process of the domain as per the GSBPM, the subject matter expert (SME) has developed guidelines for evaluating the current situation and making relevant changes and improvements based on it.

Modeling the existing and newly-developed statistical business processes using the guidelines as per its phases and methods, the following significance will be revealed.

- The value and use of statistics will be increased by defining statistics subject to the needs of users and making relevant changes and improvements.
- Continuous improvement can be made and the quality management system can be effectively implemented by documenting the results of each statistical performance and conducting evaluation based on them.
- Opportunity to re-use and share methods, documents, research tools, software and databases used in previous or similar studies will be provided.

This guideline is a common guideline for statistical business processes in all domains, and for ease of use by SMEs, an example of a statistical business process model for specific domain is included in the appendix. But when using such example model, please note that it is based on the current situation and will need to be adjusted and updated further, if a need for the statistics changes.

2. Terminology

The following terms are used in Mongolian Statistical Business Process Model. It includes:

Статистикийн мэдээлэл хариуцсан нэгж, мэргэжилтэн	Subject matter expert (SME)
Хэрэгцээг баталгаажуулах	Consult and confirm needs
Оролцогч талын шинжилгээ	Stakeholders' analysis
Гарцын зорилгыг тодорхойлох	Establish output objectives
Мэдээлэл боловсруулалт	Data processing
Мэдээлэлд дүн шинжилгээ хийх	Data analysis
Мэдээлэл боловсруулалтын арга зүй, систем, програм хангамжийг бүрдүүлэх	Build or enhance process components
Мэдээлэл тархаалтад ашиглах элементүүдийг бүрдүүлэх	Build or enhance dissemination components
Давталт	Iteration
Ойлголт, тодорхойлолт	Concepts and Definitions
Өнөөгийн нөхцөл байдалд суурилсан загвар	As-Is Model
"Байх ёстой" буюу Бий болгох загвар	To-Be Model

The above-listed terms are described in detail in corresponding sections, respectively.

3. Common guidelines for implementation of phases and sub-processes of Mongolian GSBPM

The Guidelines to Model Business Processes of Statistical Domains as per the GSBPM determine the overall methodology for modeling the statistical business processes of a given domain, and the SMEs shall specifically

determine the model of statistical business processes for each domain based on this guideline. In accordance with the guidelines, the SMEs shall determine the model of the existing and newly-developed statistical business processes of statistical domains in the following order.

1. Determine whether the domain statistics cover all 8 phases and 44 sub-processes defined in the GSBPM. Determine whether some phases and sub-processes of the GSBPM are applicable to the statistical business process depending on the characteristics of statistical data type and data collection method. Provided that, applicable sub-processes are highlighted in yellow, and non-applicable sub-processes are highlighted in grey. In particular, in case where the statistical data is collected in a complete enumeration approach, "2.4. Planning the sampling frame and sampling", "5.6. "Calculate sampling weights" sub-process is not applicable.
2. The order of actions to be performed in the sub-processes, applicable to that statistical business process, is determined in compliance with its characteristics.
3. The order of actions, to be performed in the applicable sub-processes or sub-processes to be implemented for that statistical business process, shall be determined. Depending on the characteristics of the certain type of statistical business process, data collection and processing methods, the order of actions, commonly performed in the sub-processes applicable to the GSBPM, may change as follows:
   3.1 The order of commonly performed actions can be changed depending on the characteristics of certain statistical business process.
   3.2 Some actions may be excluded from the order of commonly performed actions
   3.3 Some actions may be added to the order of commonly performed actions

Each statistical business process has been modeled as per the principles reflected in the guidelines in collaboration with the offices, departments and SMEs in charge of the implementation of the GSBPM.

1. Identify needs:

This phase is triggered when a need for new statistics is identified, or a request or demand for revising existing statistics ("needs") arises. This phase identifies needs from relevant sources; consults with stakeholders and defines needs in detail; determines the statistical products & services meet such need and the concepts and definitions used in them; and based on it, the course of action to be taken in the next phase will be determined.

1.1 Identify needs:

In this sub-process, new needs for statistics and requirements for improvement will be determined, and decide whether to consider it in the future.

The sub-process "Identify needs" shall be implemented in the following order.

1. Determine sources for identifying needs.
2. Identify needs from determined sources.
3. Categorize and analyze needs.
4. Based on the data analysis results of the needs, decide whether to consider needs in the future.

1. Determine sources for identifying needs: Identify needs from the sources below. It includes:

1. Needs arising from changes in the policy, program, organization, structure, and budget of the statistical sector;
2. Needs arising from changes in the scope of legislations and development policies;
3. Needs arising from changes in statistical techniques, methods and recommendations issued by international organizations;
4. Tools for collecting feedback from users in each data dissemination channel: Integrated statistical database (www.1212.mn), the website for collecting feedbacks and requests from users on the NSO website, social network channels of the organization (Facebook and Twitter pages etc.);
5. NSO's SME in charge of data dissemination and customer relations (including public relations department), collecting feedback from consumers;
6. In the sub-processes 7.3 "Public announcement of statistical products and services", 7.4 "Promotion of statistical products and services" and 7.5 "Manage user support" of the GSBPM, the following feedbacks were collected while promoting and presenting the statistics: Feedback activities during monthly press conferences, seminars and workshops to present survey results, announcements and promotions of dissemination products;
7. An activity to collect feedback from key users of statistics at certain intervals: It includes activities such as user satisfaction surveys, consultations and training with key users of such type of statistics etc.;
8. Other sources to identify domain-specific needs.

The needs for statistics shall be classified as per the above-mentioned sources. Moreover, relying on the nature of the subject that submitted the feedback or the type of user, the needs will be classified as follows. It includes:

- Governmental organizations (other than state-owned universities and research institutions);
- Business organizations (other than private universities and research institutions);
- Civil society organizations and non-governmental organizations;
- Universities and research institutions;
- Organizations for international cooperation and development;
- Individuals.

Sources and classifications of users for identifying needs shall be developed together with the NSO's SME in charge of data dissemination and public relations.

2. Identify needs from determined sources: Procedure for collecting, recording and classifying user needs from sources 1-4 in the above-mentioned list of sources for identifying needs will be developed for approval by the Chairman of the NSO, and executed by the NSO's SME in charge of data dissemination and public relations. This regulation reflects the issues below. It includes:

1. Channel, frequency and order of collecting user feedback: Clearly specify via the feedback section on the organization's website, e-mail, phone call and official letter sent to the NSO. Then, clearly specify how often and how to collect user feedback via each channel. In particular, how long & how to conduct user satisfaction survey, how to collect user feedback during the announcement and promotion of dissemination products etc. issues shall be specified. Also, it should be consistent with sub-processes 7.3-7.5 of the GSBPM.
2. Record and classify user feedback: Identify what information to record and how to document each user feedback. In particular, information such as organization and individual who submitted the feedback,

their contact addresses and phone numbers, feedback submission date, detailed feedback, and feedback collection channel and user classification etc. shall be recorded. Moreover, solutions such as how to document feedback and how often to submit it to the SME in charge of statistics etc. shall be reflected here.

The NSO's SME in charge of statistics shall perform the task of detecting the need for producing the new or revised statistics from the sources listed in 5-7 of the list of sources for identifying needs.

Depending on changes in the policy, program, organization, structure, and budget of the statistical sector, there may be a need to produce the new or revised statistics.

The policy program of the domain covers documents such as "Law on Statistics" and "The National Strategy for Development of Statistics for 2017-2020" etc. In particular, section 2.6.1.6 of the National Strategy for Development of Statistics for 2017-2020 states that "to improve disability statistics" and it is an example of this type of need. Moreover, this type of need can be found in annual action plan of the NSO.

Depending on changes in the structure and budget of the statistical sector and NSO, in case of staff and budget reduction occurs, it will be necessary to reduce the scope and sample size of regular surveys. This type of need is defined as follows:

- Review whether there is a need to modify or update the statistics of the domain due to changes made in the structure and budget of the statistical sector and NSO.
- Then, review whether the objective to create and update the statistics of the domain is set in the annual action plan of the NSO, and if the objective related to the statistics of the domain is set, it will be deemed that the need has arisen.
- Identify the provisions, activities and indicators applicable to statistical domain from them (search by keyword "governmental organization in charge of statistics" and its synonyms, and sort the results);
- Compare the results of specified provisions, activities and indicators with the current statistics to identify changes in statistics and parameters that need to be created or updated.

Subject to the changes in legislation and development policy, determining the need for new and updated statistics corresponds to the Principle 1 of the "UN Fundamental Principles of Official Statistics"[1]. Provided that, the SME in charge of statistics shall determine the need for applicable statistics based on general consideration and development policy. In particular, besides general development policies and legislations such as "Sustainable Development Vision 2030" etc, for the SME in charge of industrial statistics, policy programs and legislations such as "State Industry Policy" and "Industrialization Program of Mongolia" etc. can be considered depending on the domain. The need, to be created subject to changes and reforms within the scope of legislation and development policy, is defined as follows:

- Create a domain-specific database of development policies, programs, laws, rules and regulations, consider changes & updates each time, and update the database accordingly;
- Identify the provisions, activities and indicators applicable to statistical domain from them (search by keyword "governmental organization in charge of statistics" and its synonyms, and sort the results);

[1] https://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

- Compare the results of specified provisions, activities and indicators with the current statistics to identify changes in statistics and parameters that need to be created or updated.

Subject to the changes in the field of statistics at the international level, determining the need for new statistics corresponds to the Principle 9 of the "UN Fundamental Principles of Official Statistics"[2]. Provided that, the documents developed by the UN, its specialized agencies, intergovernmental organizations and regional organizations[3] will be reviewed by the SME in charge of statistics for determining the need to be created subject to the changes and reforms in the statistical sector at the international level as follows:

- Review the released documents and create a list of international statistical organizations that required to be considered for statistical business processes;
- Identify data sources and links to download documents from specified organizations;
- Create tools for downloading newly released documents on specified links, filtering them by keywords, performing searches and determining the necessary results;
- If domain-oriented approaches, methods, classifications and manuals are modified, updated or newly-developed, study and introduce them, and determine need;
- Compare the results with the existing statistical products and services and determine the changes in statistical products, services and indicators that required to be newly-developed.

3. Categorize and analyze needs: The NSO's SME in charge of data dissemination and public relations will combine the needs identified from the sources listed in 1-4 of the list of sources for identifying needs and submit it to the SME in charge of statistics.

The identified need and need data will be classified and analyzed by the SME in charge of statistics as follows.

Table 1: Instructions for classifying and analyzing identified needs

Sources with identified needs	User type	Subject expressing the needs	Content of needs	Classification of needs
Channels for collecting feedback from users on data dissemination tools; Feedback collecting activities by the SME in charge of data dissemination and public relations; Announce and promote statistical products; Regular user engagement activities such as user satisfaction surveys etc.; Changes in domain structure, organization, planning and budget; Activities reflected in legislation; Methodology, classification, recommendations and	- Governmental organizations; - Business organizations; - Civil society organizations and non-governmental organizations; - Universities and research institutions; - Organizations for international cooperation and development; - Citizens.	In order to further consider the collected needs in detail and confirm the needs through consultation, record names, addresses, e-mails and phone numbers of the organizations and persons expressing the needs. For a need arising subject to the domain structure, organization, budget, legislation and international organization's recommendations etc., title of the submitted document,	The full meaning of the need collected from users and determined in other documents is defined and written here.	In general, there are 3 classifications. - It is possible to directly provide existing statistics - Create a new type of statistics and survey - Update and revise existing statistics The need for updating and revising the existing statistics is classified as follows. - Change concepts and definitions - Change outputs or statistical products, and micro-data dissemination etc. - Refine the classification and level

[2] https://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx
[3] https://unstats.un.org/home/international_agencies/

manuals by international organizations etc.		approved date, name and position of the person who approved the need will be discussed here.		of dissemination of statistics (extracting to the next level of classification etc.) - Add indicators and variables - Change survey and statistical coverage, sample size and sample design etc.

3. Decide whether to consider the need further: After determining the need, the SME in charge of statistics will decide whether to consider the need further or especially, whether to proceed to the next sub-process via consultation and confirmation.

For needs that can be directly provided with the existing statistics, the SME in charge of data dissemination and public relations will provide an explanation of how, and from which source, to obtain such data, and the data will be delivered to the subject who expressed such need, and thus, no further update or revision will be required.

For the need to produce a new type of statistics and survey that need to be considered further, each of the next phases and sub-processes will be considered as a statistical business process. However, depending on the results of sub-process 1.5 "Check data availability", it can be concluded that such type of need can be provided with the existing statistics.

For the need to update and revise the existing statistics, determine which sub-processes between 1.2-3.7 are applicable. However, it should not be understood as skipping the previous sub-processes and proceeding to other sub-process.

1.2 Consult and confirm needs:

This sub-process determines stakeholders or potential users who are interested in using the statistics identified as having a need to produce the new or revised statistics, implements the activities such as performing stakeholder analysis and consult with them to confirm needs etc.

The sub-process "Consult and confirm needs" shall be implemented in the following order.

1. Identify stakeholders with interests for such statistics.
2. Perform stakeholder analysis and pre-determine stakeholder engagement and interests.
3. Consult with stakeholders and confirm stakeholder needs thoroughly.

1. Identify stakeholders: Stakeholders of the statistics include the following subjects. It includes:

1. Organizations and individuals expressing the need: Users who expressed a need for the statistics;
2. Other existing or potential users who use or are going to use the statistics: It includes users who did not express a need for statistics, but regularly use such information in their activities, or users who may use the newly-produced statistics and survey in their activities;

3. The NSO's SME in charge of evaluation and monitoring: The SME reflects the need, in the statistical business process, which was created as part of ensuring compliance with the changes in domain structure, organization and budget, legal obligations, international methods and recommendations mentioned in the sources for identifying needs, discussed in the previous sub-process;
4. It includes other NSO's SME in charge of statistics and local SMEs in charge of statistics etc.

2. Perform stakeholder analysis: Stakeholder analysis shall be performed as per the following model. It includes:

Table 2: Example of performing stakeholder analysis for identified need

Stakeholder	**Needs and interests**	**Level of importance and stakeholder engagement (SME in charge of statistics)**
User who expressed that needs: Office of the National Committee on Gender	Content of needs: Produce and use gender statistics as part of the National Program on Gender Equality	Strong
Other existing and potential users: United Nations Population Fund, Ministry of Labour and Social Protection, relevant NGO and civil society	Assess the implementation of policies and programs such as laws and national programs on gender equality etc.	Medium
The NSO's SME in charge of evaluation and monitoring	The National Strategy for Development of Statistics for 2017-2020 1.2.7 "Being gender sensitive: Incorporate a gender into all statistical data collection, analysis, and dissemination processes" 2.6.1.4 Implement the provisions of "make the indicators of administrative statistics more gender sensitive, and perform an analysis based on gender statistics"	Weak

The above analysis is tentatively determined based on applicable laws, regulations and documents.

3. Consultation with stakeholders and confirmation of needs: In this phase, new or revised output or statistical data, indicators, classifications, methods, instructions, regulations, as well as the justification, purpose, importance, scope, time-frame and level of accuracy are considered and determined on every side by organizing meetings and discussions to confirm the needs in consultation with organizations, users and other stakeholders who have submitted their feedback.

Pre-combine the needs from each source to identify needs, and the needs should be confirmed in detail as follows in consultation with the stakeholders.

Table 3: Sample for a need to be confirmed in detail

#	Sources to identify needs	Pre-defined needs	Needs confirmed in detail
1	Needs of a user who expressed such needs		Write a formulation of needs confirmed in detail. When determining the formula, consider the following directions. It includes:
2	Needs of other key users		

3	Produced as part of the program, plan and budget of the statistical organization		**Ways to meet needs:** Produce new official statistics and administrative data or conduct statistical sampling; Make changes in survey and statistical coverage, methodology, sampling, indicators, classification, data collection methods, data processing and data dissemination etc. **Output:** Statistical products or outputs to be produced subject to the way to meet the needs: Survey, statistical reports, analysis, tables & graphs, and micro-databases etc. **Requirements:** Time-frame and frequency, level of accuracy of data output, micro-data dissemination, and limitations of data privacy etc.
4	Produced within the scope of national laws and development policy programs		
5	Produced within the scope of international statistical methods and recommendations		

1.3 Establish output objectives:

In this sub-process, the statistical products or outputs determined in sub-process 1.2 are defined in more detail. Here, the goals, needs, legal grounds, limitations and resources of new and revised outputs will be pre-determined. Moreover, determines the domain, theme and naming of the general indicators applicable to newly-produced and revised statistical outputs.

The purpose of the output is confirmed in detail as follows.

Table 4: Sample of establishing output objectives

#	Determined output	Output goals and requirements	Legal basis and limitations	Domain, theme and indicators of statistical business process applicable to the output
1	Statistical product or output: Survey, statistical reports, analysis, tables & graphs, and micro-databases etc.	Purpose: To provide users with information about industry trends, visions, current situations, and allow them to use and analyze micro-data etc. Requirements: Time-frame and frequency, level of accuracy of data output, micro-data dissemination, and limitations of data privacy etc.	How it is reflected in the Law on Statistics and other laws, programs and action plans of the statistical sector, and restrictions associated with them.	Domain of statistical business process: Population and social statistics etc. Theme: Social statistics etc. Indicators and statistical units: Employment in the informal sector etc.

1.4 Identify concepts and definitions:

This sub-process clarifies how the statistical units and calculation indicators with new and revised needs identified by the users who expressed the needs. The concepts and definitions may not correspond to existing standard statistical methods. This adjustment and the statistical concepts and definitions to be used, selection

and definition of variables will be performed in sub-process 2.2. Concepts and definitions to be used further in statistical business processes are defined as follows. Thus, the scope of statistical data and indicators to be calculated will be determined and reach a common understanding.

Table 5: Model for defining concepts and definitions to be used in statistical business processes

Defining unit	Concept and definition
Statistical unit: A primary unit that characterizes the issues being studied in statistical survey and data. **Example:** Households, herder households, and households with herds etc.	**Identifying sources:** Legislation, statistical methods, standards and regulatory documents (definitions and interpretation) and definitions provided by users **Example:** Herder household means a household that grazes its livestock year-round and the benefits received from their livestock is a source of their livelihood (Statistical Yearbook of Mongolia) etc.
Metrics: Indicators that users expected to see **For example:** The number of herder households engaged in intensive animal husbandry etc.	**Identifying sources:** Legislation, statistical methods, standards and regulatory documents (definitions and interpretation) and definitions provided by users **Example:** Animal husbandry activity in which profitable breeds, livestock and domesticated animals are herded and produced as per the technology in a fixed or semi-fixed manner, and the products are supplied to centralized purchasing (The first agricultural census of Mongolia for 2011. Integrated statistics) etc.

1.5 Check data availability:

Each need and output identified in this sub-process is compared with the existing data sources as per their purpose and justification, and determine whether there is a discrepancy. By implementing this phase, it will be determined whether the newly-identified needs and the outputs determined to meet them, conclude whether they can be met with the existing data sources in terms of their purpose and justification, and the course of action to be taken further will be determined. The data availability will be checked in the following order:

1. Check whether the statistics and indicators defined in the report can be obtained from other sources, and develop and implement procedures & guidelines for checking and documenting consistency of methods.
2. Determine the data source for checking the availability of output indicators: Internal data sources and external data sources of statistics.
3. Clarify the presence of output indicators in the specified data source or link it to other databases, and perform a search with the help of a search engine to determine the data availability and retrieve the results.
4. The search results should be compared to each indicator, such as the purpose, justification, concept, definition and scope of the output indicator and the level of possible accuracy, and perform a consistency assessment and identify discrepancies.
5. If the consistency assessment is low or the discrepancy is high, the course of action to be implemented will be determined.

Consistency assessment on the existing statistics will be performed as follows.

Table 6: Model for checking data availability

Consistency criteria	For identified need	For existing data and survey	Discrepancy evaluation and conclusion	Actions to be taken to eliminate discrepancies
Purpose				
Concept and definition				
Scope				
Period of time				
Level of accuracy: for sample				
Level of accuracy: for classification				

1.6 Develop the concept of statistical business processes:

This sub-process summarizes and documents the conclusions of the previous sub-processes in order to carry out the planned newly-developed or revised statistical business processes, and prepares for making a management decision on whether to implement such activity. It is the same process currently used at NSO to develop and approve any census or survey concept. This type of document would need to conform to the requirements for its development and approval, but would typically include elements such as:

- A description of the "As-Is" business process (if it already exists), with information on how the current statistics are produced, highlighting any inefficiencies and issues to be addressed;
- The proposed "To-Be" solution, detailing how the statistical business process will be developed to produce the new or revised statistics;
- An assessment of costs and benefits, as well as any external constraints.

For statistical business processes that currently exist but are planned for further improvement, the "As-Is" business process will be determined. The evaluation of the "As-Is" business process shall be performed for each phase and sub-process of the GSBPM. For a newly-developed statistical business process, As-Is model of a similar business process can be used.

Table 7: "As-Is" or current situation model

Phases and sub-processes of the GSBPM	As-Is Model	Areas of improvement and changes to be made
A	1	2
1. Identify needs		
2. Design		
3. Build statistical business process model		
4. Data collection		
5. Data processing		
6. Analysis		
7. Dissemination		
8. Evaluation		

Column 1, Table 7 describes how the statistical business process is implemented for each phase and sub-process. Issues to consider and areas of improvement are determined based on the needs identified in the previous sub-processes and their discrepancies with the existing statistics. In other words, the discrepancy is recorded in the applicable sub-processes of the "Design" phase. In particular, if the developed need requires the production of a new type of product using the existing statistics, it will be described in the section "Issues to consider and areas of improvement" of the sub-process "2.1 Design the output". Then, determine the changes to be made in the next phases and sub-processes due to such change.

On As-Is Model (Column 1), Areas of improvement and changes to be made (Column 2) section is added (1+2), the applicable adjustments are made, and To-Be Model shall be determined (Table 8). Based on the data on the areas of improvement and changes to be made, conduct revisions and changes, and the amount of additional financial and human resources needs shall be determined.

For newly-developed statistical business processes that did not exist before, direct creation model shall be determined.

Table 8: To-Be Model

Phases and sub-processes of the GSBPM	As-Is Model	Areas of improvement and changes to be made	To-Be Model	An assessment of costs and benefits as well as constraints
A	1	2	3	4
1. Identify needs				
2. Design				
3. Build statistical business process model				
4. Data collection				
5. Data processing				
6. Analysis				
7. Dissemination				
8. Evaluation				

2. Design:

This phase includes an situation assessment related to identifying design processes and statistical products and services, concepts & definitions, methods, data collection tools and business processes. It includes all the designing elements required for determining and producing the statistical products and services, identified in statistical business processes. This phase determines the applicable metadata and data that will be available as a result of statistical business processes, as well as quality assurance procedures. For periodic statistical business processes, perform this step on the first repetition, and repeat it if improvement processes were identified in the Evaluation phase of the previous repetition.

In order to reduce the time and costs spent on designing activities and maximize the comparability and usability of outputs, requirements will be established for the use of national and international standards as far as possible. Efforts should be made to reuse or align the elements of existing action plan. Moreover, the output of designing processes will serve as the basis for organizational operating model and guideline at the national and international levels.

2.1 Design outputs:

In this sub-process, the statistical outputs, products and services to be produced to meet the confirmed need shall be designed in detail. The output from this sub-process is a list and definition of the outputs and products resulting from statistical business processes, as well as a list of the systems, tools and preparations required for their production.

In this sub-process, the following actions shall be performed:

1. Prepare a list of outputs to be produced
2. Create a definition of each output product (design in detail the structure and content, at what level, for whom and in what form (what should be included in printed products such as bulletins, and what indicators should be on the data dissemination system etc.) it will be released)
3. The system tools (template file, software and website etc.) required to produce the output shall be determined.

1. Prepare a list of outputs to be produced: Based on the output and its purpose, that meets the need identified in the previous phase 1, prepare a list of outputs to be produced. For statistical business processes that have already been carried out and are to be revised, add the new output to the pre-existing outputs and prepare the list.

Statistical outputs include:

- Printed products and their electronic versions such as statistical bulletins, presentations, yearbooks and thematic research reports etc.
- Tables and charts of statistical results
- Database and system where the user can obtain data in the required time, indicator and design
- Privacy-enhancing micro-database for advanced research
- Statistical metadata etc.

2. Definition of each output product: Each output designed for production shall be defined and designed in detail as follows.

- Content: Content of tables and definitions to be included in printed products such as bulletins, presentations, yearbooks etc., and data entry period, indicators, thematic report title and content etc.
- Accuracy level of statistics: At what level of standard classification and administrative unit classification should the data be disseminated, and limitations of confidentiality and limitations of sample representativeness related to them.
- Templates of tables and charts: Indicators to appear in table rows and columns, and types of charts etc.
- Intended use of dissemination products or outputs: For printed products, for data dissemination systems, for micro-data dissemination, for metadata repositories, and for quality reports etc.

3. Determine the system required for the output: This section describes what template files, software, systems and websites will be required in connection with producing the output, and determine what changes need to be made to existing software, systems and websites.

2.2 Determine and design variables:

This sub-process defines the statistical variables to be obtained through data collection, statistical variables and units to be calculated and derived from them, determines the standard statistical classifications to be used.

Determine variables: This sub-process initially defines the statistical variables to be obtained by data collection, and the statistical variables and units to be calculated and derived from them. This will result in the production of a list of variables, their types and definitions.

The variables shall be determined and planned in the following order:

- Based on the definition of the output product, determine the parameters and create a list.
- Based on the parameter definition, determine the variables and create a list.
- Define the type and definition of each variable.
- The defined variables and their type definitions should be compared and aligned with the definitions of international methods and recommendations. Within this scope, create and use a database of concepts, definitions and classification codes of international methods and recommendations.

Table 9: Example of defining parameter variables

Indicator	Variable	Type and definition of variables
Household income	Average household monetary income per month	Ordinal,
	Average household total income per month	Ordinal,
	Average household income after taxes per month	Ordinal,
Employment status	Self-employed	Nominal,
	Employer	Nominal,
	Civil servant	Nominal,
	Private sector employee etc.	Nominal,

Create a database of nominal variables or response options used frequently in statistical surveys and data, or used in previous surveys and data. The response options of the nominal variables suitable for the indicators collected by the statistical survey and data can be obtained and used from this database.

The database of nominal variables or response options is determined as follows.

Table 10: Names, codes and definitions of nominal variables used in statistical surveys, data and databases

Indicator	Surveys, statistics and databases that have used or are using that indicator or variable	Names, codes and definitions of variables
Forms of liability of enterprises *When defining that indicator, variables or nominal response options are used here as common variables and codes in statistical surveys, data and databases.*	Business registry database Census of enterprises: 2006, 2011 and 2016 Detailed operational information of entities and enterprises for 20.. (A-AANB-1) *As shown above, the variable information has been entered for each survey, data and database that used and is using the indicator. Provided that, it includes the information on how the variables were determined*	Joint stock company – 10 Limited liability company -11 Partnership with all partners share liability – 20 Partnership with some partners share liability – 21 Cooperative – 30 State owned enterprise - 40 Local owned enterprise – 41 Budgeted organization – 60 Non-governmental organization – 70 Foundation -71 Other – 80

	for the survey, data and database. In particular, the same type of variables and code descriptions were used in the 2006 and 2011 enterprise censuses. However, if they were changed in the 2011 census, you can see them here.	*As discussed previously, the list will be created for each survey, data and database, and reflect how each variable was defined. In particular, "Joint stock company" means ..... and so on.*

Once defined the nominal variables used in that statistical business process, perform a search in the above database and select the response options to determine those variables according to the following criteria.

- For the time period, used in the latest census, survey and data;
- The product or micro-data produced as a result of that statistical business process is used in the database integration;
- The most common databases used by statistical organizations such as business registry database;
- For newly-developed survey and data, similar survey and data in terms of purpose and importance have been used etc.

Determine standard statistical classifications to use: By defining standard statistical classifications to be used for the identified indicators, a database of standard statistical classifications is created and links to further phases are established. Here, perform the tasks below.

1. Create a database of standard statistical classifications: A database of standard statistical classifications has the following two types. It includes:

International statistical classifications (ISCs) are recognized and endorsed by the national statistical authority in the domain as the result of international negotiations. These classifications are endorsed by the United Nations Statistical Commission (UNSO) as well as other intergovernmental organizations such as the World Customs Organization (WCO), the World Health Organization (WHO), the International Monetary Fund (IMF), and the International Labour Organization (ILO), depending on the domain. The International Standard Statistical Classification can be used as a model for the development of applicable national and regional statistical classifications, and should be considered as "the best practice" in key areas and should be consistent with the international statistical classification as far as possible. Therefore, international classification serves as the main source of global classification.

Including, but not limited to, the following classifications. It includes:

- The National Classification for the Economic Activities, Version 4 *(ISIC Rev.4)*
- The Central Product Classification *(CPC Rev.2)*
- The Classification of the Functions of Government *(COFOG)*
- The Classification of Individual Consumption by Purpose *(COICOP)*
- The Classification of the Purposes of Non-Profit Institutions Serving Households *(COPNI)*
- The classification of outlays of producers by purpose *(COPP)*
- The Harmonized Commodity *(HS)* Description and Coding System

- The Standard International Trade Classification *(SITC)*[4]
- The International Standard Classification of Occupations (*ILO, ISCO*)[5]
- The International Classification of Diseases (*WHO, ICD-11*)[6] etc.

At the NSO level, it is necessary to determine international statistical standard classifications for statistical business processes and create a database. This database provides a guidance on the use of standard classifications in accordance with national characteristics and links between standard classifications.

National statistical classifications (NSCs): It includes classifications based on international statistical standard classifications, reflecting national characteristics (In particular, definitions of National classification of occupations UAMAT-08 and the Harmonized commodity description and coding system etc.) and standard classifications determined under national legislations.

This type of classification includes nominal variables or response options used frequently in statistical surveys and reports, or used in previous surveys and reports. In particular, the form of liability of enterprises and entities, and the type of property can fall into this type of classification.

2.3 A data collection plan:

This sub-process identifies the appropriate method(s) and instrument(s) for data collection. The following items are described in this sub-process. It includes:

- Data collection methods: paper questionnaires filled by respondents, paper questionnaires filled by face-to-face interviews with respondents, computer-assisted face-to-face interviews, Internet-based data collection, and obtaining data from administrative data interfaces etc.
- Data collection tools: Software for survey, questionnaire, form, instruction and data entry.
- This sub-process includes the design of collection instruments, questions and response templates (in conjunction with the variables and statistical classifications designed in sub-process 2.2 (Determine and design variables)).
- Identify the legal basis for data collection, develop and organize the necessary documents.
- Also prepared things such as other necessary items to support data collection, a list of units to be reflected in survey and data, recording the progress and results of data collection, and planning instructions, definitions and assistance to data collection officers and respondents etc.

Determine the data collection method:

The success of statistical survey and data reporting depends largely on the suitability of the selected data collection method. There are several different data collection methods. When choosing a data collection method for survey and data reports, it is desirable to ensure an appropriate balance between their objectives and the resources available in the statistical organization.

When choosing a data collection method, the following factors are taken into account:

[4] These classifications are available on the website of the United Nations Statistics Division: https://unstats.un.org/unsd/cr/registry/regdnld.asp?Lg=1
[5] http://www.ilo.org/public/english/bureau/stat/isco/
[6] http://www.who.int/classifications/icd/en/

- Complexity of topic and questions status: It includes issues such as the respondent needs to use records (such as financial statements etc.), detailed explanations required to be provided to the respondent, and questions involving sensitive topics etc

- Response rates: The selection of data collection method depends largely on the response rate. In particular, although face-to-face interviews are relatively expensive, they have higher response rates than e-mail, phone or Internet-based data collection.

- Selection of respondents and their suitability: The data collection method suitable for the status of the respondent tends to increase the response rates. In particular, some respondents may prefer to fill online questionnaire forms.

- Sampling frame and target population: Certain types of data collection methods may not be suitable for a particular target population.

Choose the appropriate method for the statistical business process from the data collection methods below. Moreover, several data collection methods can be used in combination for the same statistical business process.

Face-To-Face Interview: Face-to-face interviews are mainly used in household surveys. A trained interviewer visits the respondent, asks questions and records the responses.

Pros:

- The purpose of data collection can be explained by the interviewer him/herself
- Respondent trust can be easily built, leading to increased survey response rates and data quality
- The interviewer can use flash cards to help the respondent
- Longer interviews can be conducted than telephone interviews
- Suitable for some groups with certain characteristics.

Cons:

- Costs are high, and more training and transportation costs will be used.
- Data may contain errors due to interviewer bias (depending on the interviewer's appearance and attitude etc.).
- Respondents tend to hide their personal information from the interviewer.
- There is a lack of interviewers with the necessary language and communication skills.

Telephone interview: Telephone surveys are used for both household and business surveys. Telephone data collection is widely used in combination with other data collection methods for follow-up and re-enumeration.

Pros:

- Low cost. In particular, one call center can cover all areas of Mongolia where mobile and landline communication networks have accessed.
- Interviewers are allowed to build trust and provide detailed explanations if necessary
- Data is collected more quickly

- Less errors due to interviewer's appearance and attitude

Cons:

- The interview time and number of questions are limited, and limited opportunities to ask complex questions
- The interview process can be controlled by the respondent and the interview can be stopped at any time
- Not all respondents use telephone or may not be available by telephone
- It is sometimes difficult to convince the respondents of the data collection organization and the interviewer that they are reliable, that they have the right to do so, and the information will be kept confidential etc.
- The number of landline phones is dropping.

Method of self-completion questionnaire or postal questionnaire by the respondent: The questionnaire is sent to the respondent with a postage-prepaid envelope designed for returning respondent-completed questionnaires and forms. Follow-up and clarification is also done through correspondence.

Pros:

- It costs less than a face-to-face interview
- Respondents can take their time to complete the questionnaire at their own leisure.
- Respondents have time to review their records (for example, financial documents etc.)
- Detailed written instructions and explanations can be reflected
- Allows dealing with “hard-to-contact” respondents and respondents who need to consult with others (for example, contractor accountants acting on behalf of small business partners etc.)

Cons:

- Because it is under respondents complete control whether they respond the survey or not, the response rates are often low
- It takes a long time between the time the questionnaire is delivered and returned
- Respondents may misunderstand the instructions and respond the questions
- Unsuitable for respondents with limited reading and writing skills

Delivery, return and collection of questionnaires and forms: Questionnaires and forms are delivered by the interviewer to the respondent's address along with instructions on how to complete them. The respondent shall return or collect the questionnaire back to the statistical office on or after the specified time.

Pros:

- Response rates are generally higher compared to postal surveys
- It costs less than a face-to-face interview.

Cons:

- Using interviewers is more expensive than postal surveys

- The respondent may not be present at the location or may have moved when the interviewer visits.

No matter which data collection method was chosen, the scope of the data collection tool should be compatible with the data collection needs. Paper-based or electronic survey methods, or a combination of both, are the most commonly used methods. Electronic surveys can be in the form of either computer-assisted interviews or electronic form filling.

Computer-assisted interview (CAI): In this method, the interviewer uses a laptop instead of a paper questionnaire to collect the responses. It can be used for both face-to-face interviews (computer-assisted personal interview - CAPI) and telephone interviews (computer-assisted telephone interview - CATI).

Pros:

- Questions with complex orders can be controlled by computer
- During the interview, you can make some corrections, check the responses and improve the data quality
- Data entry, some coding and processing activities are performed concurrently with interviews, and thus, reducing data collection costs and increasing efficiency.
- For phone interviews, if the phone is busy or the respondent is not on the phone, calls can be rescheduled according to 'call scheduling'
- An interviewer's performance can be monitored.

Cons:

- The cost of installing computers and equipment, ensuring regular operation, and training interviewers is high.

Electronic questionnaires and forms: Electronic questionnaire (e-questionnaire) is a method of sending questionnaires and forms to the respondent's computer via electronic mail or Internet access.

Pros:

- Data entry and editing on e-questionnaire is done directly on the host computer, saves the cost of manual data entry and editing, and improves the data quality.
- Electronic submission of information allows to get answers faster than other self-completion methods.
- Automatically modeling the data entry form allows to display questions personalized to the respondent.
- For future reuse by creating a form, it can be easily edited with relatively low cost and effort.
- Forms can be sent to anyone with Internet access, even in geographic locations where data collection is difficult or impossible by other means (For example, E-mail interview or face-to-face interview etc.)

Cons:

- The cost of developing the form, maintaining the regular operation of the system, and ensuring the security of information is high.
- Completing the e-form requires the respondent to have appropriate software, and it may require to hire someone to provide customer support.
- For the target group, requires a high level of Internet use
- Due to data privacy and security issues, respondents tend to refuse using the e-form

Internet panel: An Internet panel or online panel is a pre-recruited group of individuals and organizations who have agreed to take part in an online survey. The advantage of using an Internet panel is to increase the efficiency of data collection and reduce costs. In addition, the Internet panel allow the use of the same respondents for long time to survey changes over time.

When planning the data collection method to be used for a given statistical business process, consider the following factors. It includes:

Table 11: Factors to be considered when choosing a data collection method and points of concern within them

Factors to consider	Issues to consider and data collection methods
Statistical unit: A primary unit that characterizes the issues being studied in statistical survey and data (determined in sub-process 1.4).	The main factor in choosing a data collection method depends on the characteristics and specifics of the determined statistical unit. For instance: - For enterprises, methods such as self-completion questionnaire or postal questionnaire by the respondent; the delivery, return and collection of questionnaires and forms; and electronic questionnaires and forms etc. are preferable. - For households and individuals, methods such as face-to-face interview; computer-assisted interview; and Internet panel etc. are preferable.
Metrics: Indicators that users expected to see (defined in sub-process 1.4) **Variables:** Statistical variables to be collected by the data collection tool (defined in sub-process 2.2)	Data collection methods are selected based on the characteristics of parameters and statistical variables. In particular, for the data, to be taken from financial reports such as the sales income of enterprises, and confirmed data accuracy before submission, methods such as self-completion questionnaire or postal questionnaire by the respondent; the delivery, return and collection of questionnaires and forms; and electronic questionnaires and forms etc. are more preferable. Interview techniques are suitable for gathering data about the person, the respondent's opinion, and the situation at the time etc.
Legal regulations regarding data collection	Regulations concerning the characteristics of statistical units: surveying minors etc. Regulations for the provision of data: Legal regulations such as data privacy and electronic signatures etc.

Determine the tools that will be used to collect data:

Depending on the selected data collection method, a list of tools to be used in the data collection activity is defined here. The following tools will be used to collect data. It includes:

1. Survey questionnaire: Interview questionnaires used to collect data from households and individuals through interviews (face-to-face interviews, telephone interviews, computer-assisted interviews etc.).
2. Guidelines and instructions for interviewers: A guideline for interviewers that describes the purpose and importance of the survey, the organization of data collection, interview guidelines, explanations, relationships and interdependencies for each question and response option.
3. Data and report form: Registration form or document to collect statistics and reports from enterprises on a regular basis. Official forms and administrative statistical data forms are both included here.
4. Instructions for completing the data and report forms: For statistical respondents, the due date for submission to statistical organization, flow, order, description of each indicator of the form, the interdependency between them, the data source for retrieving indicator, and logical check etc. should be indicated.
5. Electronic questionnaire: Where collecting data on the Internet, electronic questionnaires that were developed based on approved questionnaires & forms along with instructions on how to complete

them. Here, the logical relationship and check between instructions and indicators are defined for each question section in the electronic questionnaire. Electronic questionnaires will also be used for data collection through the Internet panel.

6. Data entry form: When collecting data through computer-assisted interview (CAI: CAPI, CATI), how to prepare the data entry software is described here. In particular, there is a data entry tool, based on the CAPI application of the CSPro software, that will be used to collect data using tablet for interviews as per the survey questionnaire.

Determine the legal basis for data collection and prepare necessary documents:

Legal documents for organizing censuses & surveys, collecting statistics and reports are the legal basis for organizing these statistical business processes at regular intervals and determining the results to be achieved. It includes:

- Laws and regulations of Mongolia with provisions on census and survey;
- Government resolutions and decrees;
- Law on Statistics;
- On national population and housing census;
- It includes legal documents such as guidelines, methods, classifications and concepts etc., approved by order of the Chairman of National Statistics Office.

In order to ensure the accuracy of the data, fines and sanctions for non-disclosure of data and the intentional provision of misinformation shall be regulated subject to the relevant rights instruments. Moreover, it also defines the legal regulations related to ensuring the data confidentiality.

Based on the relevant legal provisions mentioned above, a draft official letter to be delivered to data providers and survey respondents were prepared. The following items should be reflected in the draft official letter.

- Reasons for conducting censuses, surveys and statistical reports: Article 6 “Indicators of official statistics and the basis for its release”, the Law on Statistics and Article 7 “Conducting censuses and surveys”, the Law on Population and Housing Census, and other applicable legislations.
- Rights and obligations of the respondents: As stated “To provide accurate statistical data and survey in accordance with approved or allowed indicators and methods within the specified period” in Clause 9.6, Article 9 of the Law on Statistics.
- Regarding the data confidentiality: In section 22.6 states that “Central and local statistical offices shall strictly keep the individuals and legal bodies information confidential and use the data and information to produce overall results by national, regional, province, capital city, soum, district and sectoral level and to estimate statistical indicators”, in Article 22 “Prohibition of illegal use of statistics and disclosure of confidential information” of the Law on Statistics states etc.
- Liability for failure to provide census, survey and statistics: In section 23.3 states that “Affecting business reputation may be applied to any business entity and institution, which failed to submit its statistical report in due time and repeatedly delayed its data submission and deliberately provided incorrect data or information, through the mass media.”, in Article 23 of the Law on Statistics “Sanctions for violation of legislation” etc.

Plan other activities to support data collection:

In this section, the following activities will be planned to support data collection. It includes:

- Prepare a list of units to be included in censuses, surveys and statistical reports: Determine how to prepare a list of units for inclusion in the census, survey, and statistical report. With regard to the

sample survey, determine from what sources the sample frame will be considered in the next sub-process 2.4.

- Recruiting and training data collectors: The units and employees for data collection are defined here, as well as the procedure for their recruitment where hiring contractors, and training plan for data collection units and employees.
- Planning the data collection preparation: The tasks are planned within the scope of the data collection preparation. It includes: The budget and equipment needed for data collection are planned.
- Develop a data collection plan: Here, the period of data collection, the order and time of submission of data reports to the statistical organization are planned and determined.
- Plan a system for capturing and reporting the scope of surveys, data, and reports to be used during data collection.

2.4 Sampling frame and sampling design:

In this sub-process, only sample-based data collection activities such as statistical surveys are relevant. It identifies and specifies the population of interest, defines a sampling frame (and, where necessary, the register from which it is derived), and determines the most appropriate sampling criteria and methodology (which could include complete enumeration). Common sources for a sampling frame are administrative and statistical registers, censuses and information from other sample surveys. This sub-process describes how these sources can be combined if needed. The actual sample is created in sub-process 4.1 (Create frame and select sample), using the methodology, specified in this sub-process.

Determination of the sampling frame is applied not only to sample surveys, but also to complete enumerations, surveys and statistical reports. The sub-process ends when determining the statistical or sampling units for data collection and how they are generated from sources for complete enumerations, surveys and statistical reports.

In this sub-process, the sampling design or following actions shall be performed.

1. Determine the sampling unit based on definition of data collection unit
2. Determine the sampling frame
3. Determine the key metrics to use when calculating the sample size based on the definition of parameters and variables.
4. Determine the sample size
5. Select the sampling method and determine the sampling procedure
6. Establish a methodology for calculating sampling weights, substitutions and adjustments
7. Estimation of sample parameters
8. Prepare a sampling tool for standard sampling.

1. Determine the sampling unit: In this section, first of all, the sampling unit is defined based on the concept and definition of the statistical unit of data collection specified in Table 4 in sub-process 1.4.

A sampling unit is an object that contains data concerning the subject under research and is an independent unit that is divided and considered to sample the target population. In particular, for surveying household income and expenditure decisions, it will be a household; and for industrial production data, it will be an enterprise operating in the industrial sector. But depending on the survey findings, characteristics of the target

population, sampling and optimality of data collection, the sampling unit may be different from the statistical unit. In particular, in labour force surveys, although the statistical unit is the population of all ages, the sampling unit may be households due to the optimality of sampling and data collection.

The order, description and examples of sampling units are presented in Table 12.

Table 12: Order, description and example for determining the sampling unit

#	Order	Description	Example
1	Think about the purpose of the survey	The purpose of the survey or the questions to be clarified during the survey are the main source for determining the statistical units to be included in the data collection. In particular, for the example discussed here, the survey defines the unit (household, population and gender).	The purpose of the Time-Use Survey is to determine the division of labor within the **household**, time spent by the **population** on paid and unpaid work, and the lifestyle of the **population**. The peculiarity of this survey is that it is one of the main sources of data used to estimate the time spent on non-market activities at the household level, as well as a source of data necessary to assess the implementation of the National Program on **Gender** Equality.
2	Definition of statistical units based on the survey purpose	A statistical unit is a section containing data about the object of survey (data related to the purpose of the survey). In other words, from whom and from what can the data be obtained? Also, some limitations may be defined here according to the purpose of the survey.	People of all ages will provide data on the division of labor within the household, time spent by the population on paid and unpaid work, and the lifestyle of the population. Thus, the **individual** is the unit of this survey. Moreover, the purpose of the survey determines the need to separate data by gender. Moreover, survey limitations may include limitations such as excluding people living in nursing homes or people in prisons etc.
3	Determine the sampling unit	The sampling units are determined based on the optimality of the groups, sampling and collection of data that make up defined statistical units. The statistical unit and the sampling unit may be the same or different. However, if different, they are mutually dependent and inclusive.	The sampling unit can be defined as a household based on the fact that people live in household and how the employment and lifestyle of the family members depends on the family lifestyle, the number and structure of the family members.

Depending on the objectives of the survey, the sample and the optimality of data collection, the sampling unit may consist of the following types: household, individual, enterprise, administrative unit (province, capital, soum, district, bagh and khoroo etc.), census unit, area and dwelling etc.

2. Determine the sampling frame: Once the sampling unit has been defined, a list of sampling units and a sampling frame containing the data to be used for the sample will be determined. The list of all units in the target population prepared for the sample is called the sampling frame. Sampling frame:

- An attribute that identifies the primary unit in the target population,
- The sampling frame should include an indicator of the representativeness to be used.

The following are important in determining and creating a sampling frame.

- Choose the most appropriate sample design options
- Reduce the number of units that cannot be included in the survey,
- Reduce the probability of selecting a unit that does not contain the characteristics of the primary sampling unit and improve data quality by reducing non-sampling errors.

The sampling frame will be taken from the following sources:

- Business registry database: It will be used as a sampling frame for selecting enterprises from the database of enterprises.
- Database of population and households: A database containing data about households and individuals. The database will be used as the sampling frame for selecting statistical units of this type.
- Census database: There are databases created as a result of censuses such as Population Housing Census, Enterprise Census, Agricultural Census and Livestock Census etc.
- Administrative data: Includes registration databases of government agencies and other organizations.
- Geographic database or Area-based frame:
- Other databases: A list of the target population prepared for the survey, registration data and registration databases other than those mentioned above.

The sampling frame is usually classified as follows.

Table 13: Types of sampling frames and their specifics

Types of sampling frames	Specifics and considerations
List Frame	Considerations when preparing and using a list frame: • Unreal (non-existent) units may be listed, • Same unit is listed more than once or duplicated, • Existing units are not listed, • Unit identification parameters have changed, • Unit identification parameters may have been entered incorrectly.
Area-based Frame	The area-based sampling frame comprises the geographic units in a hierarchical arrangement. The field sampling frame has the following specifics. It includes: • The entire area is covered • Boundaries are clearly determined • The unit is illustrated. Examples of using this type of frame • When conducting the multi-stage frame sampling, this type of sampling frame is usually used to select a primary sampling unit (PSU). • Moreover, this type of sampling frame can be used for repeated household surveys. Items used to make the sampling frame: • Census block or enumeration areas • Maps of administrative sub-divisions • Aerial photographs of housing units • Satellite images of land cover
Multi-Stage Frame	• Multi-stage frames are often based on administrative and territorial units. • The primary sampling frame covers the entire target population, and the list of units in the next phase comprises the next phase units from the units selected in the previous phase. • This type of frame is used for multi-stage sampling.

	• The primary sampling frame is used in the first sampling frame, the secondary sampling frame is used in the second sampling frame etc.
Frames for Series of Surveys	• In multi-stage sampling, performs the operations of preparing the sampling frame and sampling at each stage until finally the primary unit is sampled. • To ensure the efficiency and cost-effectiveness of one or more phases in these operations, single-sampling frame model can be used for several surveys. • The system of regular frequency surveys is known internationally as the Master sampling frame. • A sampling frame or sampling that is used simultaneously in several surveys is known as the Master sampling. • The master sampling frame is basically a list of area units that covers the whole country.

When determining the sampling frame and using it to select the units to be included in a particular statistical business process, survey or statistical report, the following requirements should be established, and the database that can be used as the sampling frame should be considered and selected as per the requirements below (Table 14).

Table 14: Requirements for sampling frame

Scope	Requirements
Quality related	• The probability of selecting each element of the target population must be non-zero. • All elements must be completely covered • Each element can only be registered once • Ensure scheduled regular updating of the sampling frame
Effectiveness related	• Includes secondary data that is accurate and up to date • Units can be visualized on the map • Ease of use and processing • Descriptive statistics can be calculated
Cost related	• Inexpensive to obtain and prepare • Low operating costs • Low maintenance costs

Moreover, this section describes planning the following issues related to the preparation of sampling frame data for the intended sample. It includes:

- Remove Duplicates
- Exclusion of non-existent units (liquidated enterprises, burnt or demolished buildings etc.)
- “Inclusion of newly developed units (newly established enterprises, and commissioned building etc.)
- Update supporting data (sales volume of the enterprise, and changes in the number of employees etc.).

The database of sampling frame should contain the parameters below (Table 15).

Table 15: Required parameters in the database to be used as the sampling frame

Data	Group	Purpose
Default identifier	Identifiers	Unique and non-repeating identification of the unit

Secondary identifier(s)		Place the unit
Stratification variables	Characteristics of the unit	Group units for sampling
Measure of size		For use in proportional probability sampling, grouping and calculations
Sampling indicator	Operational data	Show the selected unit
Indicators of change		Maintain a time sequence that preserves the order of the status and source of changes

3. Determine the key parameters to use when calculating the sample size: In this section, based on the definition of indicators and variables to be calculated from the results of the survey, the key indicators used in the selection of the sample will be determined, and on their basis the sample size will be determined.

The key indicators for sampling are indicators that directly express or directly related to the indicators determined during the survey to determine the sample size, sampling design, sampling method, and the classification and grouping of units within the sampling frame.

The key indicator used in calculating the sample size is the indicator in the database of the previous survey of the indicator and the indicator in the database that will form the sampling frame. In particular, for a survey determining the sales revenue of enterprises in the trade sector, sales revenue data of trade sector enterprises in previous sample surveys or business registry databases will be used as key indicators for sample size calculation.

In the absence of data about this indicator, the available potential indicator that is directly correlated to it will be used as the key indicator that will be used to calculate the sample size. In particular, to conduct a survey to determine the capacity utilization of an industrial enterprise, the indicators available in the business registry and indicators related to a given indicator, such as the number of employees and sales revenue of the enterprise, can be used as a key indicator.

4. Determine the sample size: When determining the sample size, the following was taken into account. It includes:

- Confidence interval
- Sampling error rate
- A probability of occurrence of a phenomenon and standard deviation of key parameter of the sample in target population
- Formula for determining sample size
- Other indicators of cost and effectiveness concerning the implementation of survey data collection.

5. Select the sampling method and determine the sampling order: Based on the key indicators and sampling frame data used to calculate the sample size, choose from the following sampling methods. For instance:

- Simple random sampling: Use this method, if the sampling frame does not have data related to the key indicators used to calculate the sample size or the indicators to be determined in the survey, it only consists of a list of sample units.
- Systematic sampling: If a key indicator is given to determine the sampling unit, then a systematic sampling can be conducted in the order of that indicator. For instance, use this type of sampling method and increase the representativeness of a sample, if the list of herder households is given with the number of livestock in those herder households, the list of households is given with the number of household members, and the list of enterprises is given with their number of employees etc.
- Stratified sampling: Given the key indicators to determine the sampling unit, stratify the sampling units based on these indicators, and then conduct a sampling for each strata. In this method, the total sample size will need to be allocated to each group and, and the sample size will be distributed to each strata using proportional distribution, equal distribution, and Neumann distribution methods etc.
- Cluster sampling: Sampling units are divided into clusters as per geographic location and administrative unit, selection is made from the clusters, and all cluster units are included in the survey. There are 2 options in this method: cover the entire cluster or a certain part of the cluster.

After selecting a sampling method, the sampling order by such method is determined. Units for survey and reporting will be selected from the sampling frame and a list will be compiled in sub-process 4.1.

6. Establish a methodology for calculating sampling weights, substitutions and adjustments: When determining the sample, the total number of sampling units in the target population is compared to the sample size. For stratified and cluster sampling, the sampling weight is calculated for each strata or cluster. Regardless of which sampling method is used, in order to check whether the sampling weight is calculated correctly, multiply the sampling weight by the sample size and see if it is equal to the total target population size.

Then, determine how to adjust the sampling weight in case the selected unit is missing during data collection; and if the sampling unit is not found or not included in the data collection for any reason, the method of substitution shall be defined. Moreover, the previous action also considered the sampling procedure to determine if there would be a reserve unit.

7. Estimation of sample parameters: Sampling error, representativeness of the target population, and parameters reflecting homogeneity of the sample population were calculated. Moreover, it is planned how they will be evaluated at the data analysis phase and production of dissemination products.

8. Develop sampling applications and template files: Sampling methods and sampling procedures can be prepared in this section by developing a sampling application or template file in MS-Excel as per the methodology described in the previous phases. Sampling application and template file contain functions such as processing the target population, determining the sample size, grouping by key parameters, sampling, and calculating the sampling weight etc.

2.5 Design processing & analysis:

This sub-process describes the statistical processing method used in the “Data Processing” and “Analysis” phases. It may include a description of actions such as coding, editing, imputing, calculating, integrating, validating and finalizing the database etc.

Design data processing: This section describes the statistical processing method used in Phase 5 "Data Processing" and the techniques for editing, imputing, calculating, integrating, validating and finalizing the database.

In this section, the following operations will be performed. It includes:

1. Determine the software for data entry, integration, validation and editing.
2. Determine the limits of variable values and the relationship between the variables.
3. Determine the checks to be performed on data entry.
4. Determine a data integration method.
5. Determine the database encoding scheme.
6. Determine the type and direction of checking the database
7. Clarify errors in the database and determine how to fix the results of clarification
8. Determine the imputation method.
9. Impute sampling weights.
10. Determine the criteria for determining that a database is finalized.

1. Determine the software for data entry, integration, validation and editing. Data entry, integration, validation and editing software may be in the following manners: It includes:

- Software package designed for a specific type of statistics or survey data (including all data entry, integration, validation and editing). In particular, Livestock census tool, and Monthly industrial reporting AY-1 tool etc.
- Syntaxes for data entry, integration, validation (batch editing etc.) and editing developed using standard statistical analysis software (CSPro, SPSS, Stata and R etc.).
- System and software for downloading, transferring and collecting the necessary data from the databases of other organizations.
- Template files and macros, processed using the MS-Excel office software, for checking and editing data. However, this type of processing tools should be avoided whenever possible due to the requirement to document every operation in the database.

A software that performs data entry, integration, validation and editing in batches, and syntax, macros and template files to be used for each action shall be determined for every action.

2. Determine the limits of variable values and the relationship between the variables:

Determine the limits of variable values. Determine the limits of values and the number of characters for each variable described in sub-process "2.2 Determine and design variables".

For numeric variables, set lower and upper limits for values to be chosen. In particular, the minimum age limit for respondents is 18 years of age, and the maximum age limit is 100 years of age, or the interval of values is 18-100 years of age.

For the named variables, determine named variables or response options. Statistical classifications are also applicable to this type of variables. In this case, you can specify a Lookup or a reference file.

For text-type variables, the number of input characters is limited, and you can specify the characters that should or shouldn't be included in the input characters. In particular, the first 2 characters of a survey participant's registration number can be defined as letters, and the next 8 characters as numbers.

Determine the relationship between variables. Determine the following relationships between the variables described in sub-process "2.2 Determine and design variables".

- Logical relationship: Determine whether the numeric values of the variables are mutually greater or less, and the logical relationships between the values of the named variables.
- Check the sum total or balance: A relation where the sum total of numeric variables is equal to the value of another variable.
- Logical Sequence and Skipping Pattern: Depending on the value of a given variable, a skipping pattern without entering the value of the next question or variable etc.

The limits of variable values and the relationship between the variables will serve as the grounds for checking and editing the data at this phase.

3. Determine the checks to be performed on data entry: Based on the variables described in sub-process "2.2 Determine and design variables", and their value limits and relationships, the checks to be conducted at the data entry phase will be determined.

Defines an error message to be displayed when out-of-range value is entered (crazy code or value), the relationship between variables is lost, and previously entered units and instances are entered etc. In particular, "Variable a must be greater than the value of variable b, please check" etc. In the same case, indicate whether the value is allowed or not. If it is allowed, specify that the descriptive information will be reflected and documented.

4. Determine a data integration method: For merging databases generated from different sources, the key parameters or variables that will be used for merging databases, the requirements for the database structure, and how to check for duplicated units in databases etc. will be described here.

In case where merging homogeneous databases of the same type or having the same structure, a key indicator is indicated to check for duplication of databases. Merging homogeneous database includes the integration of data entered by statistical units and the integration of data of a given period into a dynamic database.

In case where merging heterogeneous databases, the database compatibility shall be specified in addition to the key parameters.

5. Determine the database coding scheme: Determine the coding scheme for open-ended responses in the database

For open-ended numeric responses, variables can be grouped and coded based on their values. In particular, if the respondent's age variable is in the range of 15-19 years of age, it is recoded as "1" or "15-19 years of age"; and if the number of employees of the enterprise is in the range of 1-4, it is recoded as "1" or "has 1-4 employees" etc.

For text responses, it can be coded depending on the meaning or included words in the text, and in this case, the coding scheme shall be determined.

6. Determine the type and direction of checking the database: After entering the data, determine a method on how to check for errors that cannot be detected at the data entry phase or were forced at this phase. The database will be checked in the following ways, and depending on the type of statistics and survey, other additional checks may be performed:

- Repeat the checks at the data entry phase.
- Check for missing values or null values. There may be two reasons, for such value type, either left unquestioned during data collection or omitted during data entry.
- Determine the growth and decline by comparing it with a dynamic database containing historical data.
- Determine the outliers for each variable in the database.
- Compare with other databases and indicators, reference values etc.

Methods on documenting errors from the above type of checks or creating error protocols is described here.

7. Clarify errors in the database and determine how to fix the results of clarification: The following are instructions for identifying, clarifying and correcting errors for each type of error in the error protocol generated by database check. There can be several methods for clarifying errors, but not limited to them. It includes:

- In order to clarify the error, contact the statistical unit or respondent who submitted the data
- Clarify by comparing with databases of the previous and other periods etc.

Based on the results of the clarification, instructions for performing the correction will be described here too. In particular, how to edit using clarifications and data obtained from which source etc.

8. Determine the imputation (replacing) method: It indicates whether there are incomplete or missing values in the database and whether to impute it if this type of error is caused by data collection. In case of handling imputation, determine how to impute using one of the following methods.

- Delete a variable with null value or a unit (instance) with null value from the entire database (listwise deletion)
- Directly get (hot-deck) the value of the previous unit (instance) sorted by the variable
- Get from other database (cold-deck)
- Mean substitution of the variable (mean substitution)
- Impute the null value by the regression equation (regression)

9. Impute sampling weights. For simple random and systematic sampling, impute the same weight for each database unit; and for stratified and cluster sampling, impute different weights to the units of strata or cluster. Thus, the code variables of strata or cluster are included in the database.

Moreover, the number of digits after the decimal point of the weight variable will be determined and the weight must be entered with 4-6 decimal digits to ensure a level of accuracy.

10. Determine the criteria for determining that a database is finalized. By clarifying the criteria for determining the readiness of the database for analysis after the completion of the necessary processing, it will be possible to conduct a full-fledged database check.

To find out if the database is finalized, complete the checklist with the questions below. It includes:

- All above sub-processes 1-9 have been completed.
- Rechecked the database, and described each undetected error or error reflected in the error protocol.
- There are no unfilled null values, if they are exist, there is a description of the acceptance of such type of issues etc.

Plan data analysis: This section describes the statistical analysis method used in the phase 6 “Analyze”. The following is defined here, but not limited to, depending on the characteristics of the data type and output data defined in sub-process 2.1.

- Calculate descriptive statistics indicators or statistical indicators such as frequency, average, mode and median etc.
- Database analysis and calculations. Add new variables, units, aggregates and sampling errors to the database. Their methods of calculation is described here.
- Calculate the parameters of the output design. Calculate other statistics such as indices, percentages and ratios etc. Their methods of calculation is described here.
- Statistical analysis. This section describes whether to conduct correlation, regression, factor analysis and time series etc., if it is done, determines which method will be used.

2.6 Determine the statistical business process model

In this sub-process, determine the method and workflow from data collection to dissemination, take an overview of all the processes required within the whole statistical production process, and they are reviewed to ensure that they match the expected results with no gaps or discrepancies. Various systems and databases are needed throughout the process. A general principle is to reuse processes and technology across many statistical business processes, so existing solutions (systems and databases etc.) should be examined first, to determine whether they are fit for purpose for this specific process. Then, if any gaps are identified, new solutions should be designed. This sub-process also considers who will be responsible for what and when.

As explained in Table 16, determine the elements that required to be considered from data collection to dissemination, how it should be collected, who is responsible and when it should be ready etc. It will indicate what to improve and create new directions in the next phase “3. Build statistical business process model”.

Table 16: Considerations when developing the concept of statistical business processes

Phase	Sub-process	Required methods, systems, data and resources	Available methods, systems, data and resources	Methods, systems, data and resources to be improved or created	Subject matter expert in charge	Implementation period
Data llection	4.1. Create a frame and select sample	Sampling frame and its required parameters	Databases and indicators that are available for use as a sampling frame	Sampling frame database, Indices	SME in charge of provision and creation of new sampling frame database	Implementation time to provision and creation of new sampling frame database
	4.2. Prepare for data collection	Preparations concerning the specified data collection method Data collection tools (forms, questionnaires and instructions) Letter to respondents (indicated the legal basis for data collection) Other items to support data collection: A list of units for report & survey, training plan for surveyors, and manuals etc.	Data collection tools, training plans, manuals, letters to respondents etc. used in previous iterations and similar statistics.	In addition to the newly created items needed to collect statistics, human resources, equipment and cost estimates for data collection.	SME in charge of data collection preparation	Due time for data collection preparation
	4.3. Implement data collection	Data collection plan What you need to prepare for data collection	Charts of official statistics Guidelines, methods, systems, software, infrastructure and resources prepared for data collection	Items that need to be created in relation to a given iteration and newly created report and survey	SME in charge of data collection	Start and end date of data collection
	4.4. Finalize data collection	Streams, systems and software for data transmission and collection Instructions for finalizing data and data collection requirements	Streams, systems and software for data transmission and collection Instructions for finalizing data and data collection requirements	Items that need to be created in relation to a given iteration and newly created report and survey	SME in charge of data collection and integration	Deadlines for collection and submission of data to the NSO
Data ocessing	5.1. Integrate data	Instructions and methods for combining, classifying, coding, validating, editing and imputing the data; creating new variables and units; imputing sampling weights; calculating aggregates; and finalizing data files Software and syntax to perform these operations	Created and currently using instructions and methods, software and syntax to perform these operations.	Methods, guidelines and software to be updated and developed in relation to a given iteration and newly created report and survey	SME in charge of data processing	Preparation time for data processing and analysis
	5.2. Classify and code					
	5.3. Review & validate					
	5.4. Edit & impute					
	5.5. Derive new variables & units					
	5.6. Calculate sampling weights					
	5.7. Calculate aggregates					
	5.8. Finalize data files					
Analysis	6.1. Plan output design	Newly created output and its requirements Instructions and procedure for preparing a output design Result table, reporting software and template files	General instructions and procedure for preparing a output designs, and general requirements for output designs Result table	Methods, guidelines and software to be updated and developed in relation to a given iteration and newly created report and survey	SME in charge of statistics	Deadline for preparing output design
	6.2. Review and validate the output	Sources to be used for review, validate and interpret the output Order, method and instructions to review, validate and interpret the output	Databases and other sources (for comparison etc.) that will be used to review and validate the output design. General order, method and instructions to review, validate and interpret the output		SME in charge of statistics	Deadline to review, validate and interpret the output
	6.3. Interpreting the Output					

	6.4. Monitoring the protection of data confidentiality	Data confidentiality issues concerning newly created output: For pivot tables and results For disseminated microdatabases	General procedures and recommendations for ensuring data confidentiality: For pivot tables and results For disseminated microdatabases		SME in charge of statistics	Time to prepare pivot tables and databases as per the procedure for ensuring data confidentiality
	6.5. Finalizing the output	List and content of result tables and databases to be used for data dissemination and next phase analysis	Integrated database of statistics and microdata		SME in charge of statistics	Deadline for finalizing the result table and microdatabase
ssemination	7.1. Update output systems	Data and information to be uploaded to the data dissemination system, Outputs with metadata or user-accessible elements in the data dissemination system	Data, information and their structure in the data dissemination system Metadatabase and its specifications and definitions	Methods, guidelines, software and templates to be updated and developed in relation to a given iteration and newly created report and survey	SME in charge of statistics SME in charge of IT issues	Uploading time for temporary data and information to the data dissemination system
	7.2. Producing statistical products and services	Tables, charts, descriptive texts and methodological notes for regular printed products such as statistical bulletins, presentations and yearbooks etc. Specialized survey reports and studies. Interactive tables, charts and infographics Downloadable tables, data and microdata for inserting on dissemination systems	Tables, charts, descriptive texts and methodological note templates for printed products and general guidelines for processing them Programming system for preparing interactive tables, charts and infographics Tables, data, microdata, their structures, models and requirements in the data dissemination system		SME in charge of statistics SME in charge of data dissemination SME in charge of IT issues	Completion deadline of dissemination products
	7.3. Public announcement of statistical products and services	Plan and schedule for the provision or dissemination of statistical products and services to the public resulted by these statistical business processes. Dissemination types of statistical products and services Considerations when announcing, disseminating and interpreting the data	Date of announcement and dissemination of statistical products (press release date) Procedures for the dissemination of statistical products, covering the tasks such as announcing the dissemination products and communicating with users etc.		SME in charge of statistics SME in charge of data dissemination	Scheduled announcement of dissemination products
	7.4. Promoting statistical products and services	Plan to promote data dissemination products and services Types of advertising and promotional contents	Common promotion tips for dissemination products Channels for promoting statistics Previously developed advertising content templates		SME in charge of statistics SME in charge of data dissemination	Promotion period for dissemination products
	7.5. Manage user support	Channels and approaches to collect user feedback and demands concerning dissemination products	General guidelines for collecting and responding to user feedback and demands concerning dissemination products		SME in charge of statistics SME in charge of data dissemination	Deadline for accepting offers and applications concerning dissemination products

3. Create statistical business process model**:**

This phase builds and tests the production solution to the point where it is ready for use in the "live" environment. Based on the results of the "Design" phase, previously created methods, approaches, data and software for statistical business processes shall be reused in order to create the operating environment for a given statistical business process. If they cannot be taken and used directly, they shall be modified or changed, or the necessary elements shall be produced to create a real environment for the implementation of the statistical business process. Modifications, changes and newly created elements should be created in a way that they can be reused for other statistical business processes. For statistical business processes performed at regular intervals, this phase is performed on the first iteration or when there is a change in the statistical business process, not every iteration.

3.1 Creation of data collection tools:

This sub-process creates the elements used in the "Data collection" phase. They will be created based on the documents and specifications defined in the "Design" phase. The following items will be considered in data collection tools:

1. Developing questionnaires and forms for statistical enumerations, surveys and reports: Statistical reports, questionnaires and forms will be developed based on the needs, indicators and methodologies described in the previous phases. In this phase, the following actions will be performed:

- Search for previously used statistical questionnaires and forms, their question and response options, classification code base for each defined indicator and variable, and retrieve question and response options.
- Determine the question and response options aligned with the previous versions of the statistical questionnaires and forms, and data objects described in the previous sub-processes.
- The developed questionnaires and forms will be used to collect suggestions from sectoral ministry, other stakeholders and users via the feedback and discussion platform, and their suggestions will be taken into consideration.

Received suggestions and recommendations are documented as follows.

Table 17: Table for recording suggestions and recommendations received on draft questionnaires and forms, and how they are reflected and described

#	Organization, officer and user who submitted the proposal	Suggestions and recommendations	Reflection and description of suggestions and recommendations
1			
2			
3			
4			
5			
6			

- Then, the developed questionnaires and forms will be tested. Tests will be conducted as per the general instructions on testing questionnaires and forms, and how test results should be reflected on questionnaires and forms.
- A test report will be prepared, appropriate corrections and changes will be made to the draft questionnaire and form based on the test results, it and will be discussed by the Methodological Standing Committee.
- On the basis of the decisions and recommendations from the Methodological Standing Committee, appropriate corrections and changes are made, which will be discussed and approved at the higher level meeting or the Chairperson's council meeting. The approved version of the questionnaire and form will be presented, as well as the question and answer options reflected in it.

2. Develop instructions for completing questionnaires and forms for statistical enumerations, surveys and reports: On the basis of statistics, finalized questionnaires and forms, instructions for completing them will be developed. Instructions for completing questionnaires and forms are processed together with the questionnaires and forms in the same order.

3. Develop data entry software for statistics, enumeration and survey: Based on the selected data collection method, the software for entering statistical and survey data will be developed. In this phase, the following actions will be performed:

- Check if there is a similar data entry software in the database of the statistical analysis software.
- Similar data entry software element is used to create a data dictionary structure for the data entry software.
- Data entry checks and logics will be performed in the data entry phase of the data entry software.
- Data entry form formatting
- Test the developed data entry software.
- Based on the test results, the data entry software will be maintained and finalized.

In case of collecting data from external databases within the scope of internal database of the statistical organization and administrative statistics, it includes the development of software and systems for sharing and downloading data.

3.2 Build or enhance process components

The methods, systems and software required for the “Data processing” and “Analyze” phases will be created as designed in the “Design” phase, or changes and improvements to existing methods, systems, and software will be made here. It may include the rules for monitoring the data collection process, transmission and verification of data, as well as software and metadata management systems.

Check the readiness and adequacy of the software and systems required for data processing and analysis, and create new ones or introduce measures to expand and improve if necessary. The software and systems required for data processing and analysis include the following elements used in the “Collect” (Phase 4), “Process” (Phase 5) and “Analyze” (Phase 6) phases. It includes:

1. Enter relevant data for the collection of statistical and survey data into the **monitoring system of data collection process**. The following components are integrated into the system to monitor the progress of all statistics collected by the statistical organization.

- Flow, order and timing of submission of data from the data provider through the local statistical unit to the NSO.
- A registration section for recording statistics, a list of units to be included in the survey, and status and reason of data collection.
- A programmed section for reminding submission deadlines of statistical reports, survey data and information, and implement further measures to receive information from units that did not respond to the survey etc.

2. Software and systems for data entry and collection. Besides the data entry software discussed in the previous sub-process, creating a system for collecting and transferring data from other organization databases will be described here.

3. Software for database check and maintenance. It includes the syntaxes for testing specialized software and standard applications. Changes to be made in the field of improving the check due to new demands, needs, indicators and modifications shall be entered into the previously developed software and syntax.

4. Data processing software. It also includes the syntaxes for testing specialized software and standard applications. These software and syntaxes will perform classification & coding, imputation, creation of new variable units, entry of sampling weights into the database, calculation of aggregates, and finalization of the data file etc. To finalize the data file means actions such as making relevant checks and changes to the database, loading error-free complete data into the database with relevant interpretations and metadata after the processing mentioned above.

5. Data analysis software It also includes the syntax for testing specialized software and standard applications. These software and syntaxes produce the result table, perform the analysis identified in the phase 2.5 “Design processing & analysis” of the data, and perform the action that produces the required results.

It shall be implemented in the following order. It includes:

- In relation to the implementation of defined process flowcharts and plans, review the list of databases, systems and software that need to be improved and created; and based on the evaluation of the existing capacity, make a decision whether to make improvements or develop new ones.
- Check if there is a similar system and software in the database of the statistical analysis software
- Develop required systems and software using similar system and software models
- Test the developed data entry system and software
- Based on the test results, the system and software will be maintained and finalized.

3.3 Build or enhance dissemination components

This sub-process describes the activities to build new components and systems, or expand existing components needed for the dissemination of statistical products as designed in sub-process 2.1 (Design outputs). All types of dissemination components are included, from those that produce traditional paper publications to those that provide web services and use default data.

This sub-process describes implementation of actions such as the creation expansion of software, systems and applications to be used in steps, starting from “7.1 Update output systems” of the “Dissemination” phase and

ending with “7.5 Manage user support” sub-process, as designed in the sub-process “2.6 Determine the statistical business process model”,

Table 18: Elements used in the data dissemination

Sub-processes of data dissemination	Element used in the data dissemination
7.1. Update output systems	Software for loading data and information into the data dissemination system Prepare the data and structure to be loaded in compliance with the structure of the data dissemination system Prepare the metadata structure to be entered into the metadatabase
7.2. Creating statistical products and services	Prepare templates of tables, charts, descriptive texts and methodological notes for regular printed products such as statistical bulletins, presentations and yearbooks etc. Prepare a customized survey report template Prepare templates for interactive tables, charts and infographics Downloadable tables, data and microdata structures for inserting on dissemination systems
7.3. Dissemination schedule for statistical products and services	Prepare templates for advertising products to be disseminated using social media and email marketing
7.4. Promoting statistical products and services	Prepare templates for promoting dissemination of statistical products
7.5. Manage user support	Create channels for collecting user feedback and demands concerning dissemination products, and enter them into the system to communicate with users.

3.4 Modeling a statistical business process

This sub-process configures, sequences and models the workflow, systems and interrelationships from data collection through to dissemination. At the same time, place revised and newly created elements, determined to be used in the previous phases 3.1-3.3 (Table 19), subject to the sequence of phases from data collection through to dissemination.

Table 19: Statistical business process model and required elements

Phase	Sub-process	Element created
4. Data collection	4.1 Create a frame and select sample	Sampling parameters and sampling software
	4.2 Prepare for data collection	System for monitoring and managing data collection process
	4.3 Implement data collection	Data collection system
	4.4 Finalize data collection	Data collection report template
5. Data processing	5.1 Integrate data	Compare and integrate the structure of each database to be merged - a variable specifying the integration rules and merging keys Data integration software
	5.2 Classify and code	Methods, categories and code lists for classifying and coding open-ended response fields Software and syntax to code open-ended response fields automatically
	5.3 Review & validate	It defines the rules and methods for detecting errors in statistical parameters. Software and syntax for detecting parameter errors Rules and methods for fault detection in time series

		Software and syntax for fault detection in dynamic systems
	5.4 Edit & impute	Rules and methods for clarifying and correcting errors Rules and methods for imputation (hot deck, cold deck and mean substitution) and regression imputation Software, syntax and batch for implementing the imputation operation
	5.5 Derive new variables & units	List of variables to be newly developed Deriving new variables - rules and methods for creation (through arithmetic operation and regression equation) Deriving new variables - develop software, syntax and batch for creation List of units to be created Rules and methods for creating new units (statistical units, their definitions and intercorrelations) Deriving new variables - software, syntax and batch for creation
	5.6 Impute sampling weights	Rules and methods for adjusting sampling weights and entering sampling weights in the database Software, syntax and batch for calculating the sampling weight, entering the sampling weight into the database
	5.7 Calculate aggregates	Rule and method for calculating aggregate indicators from microdatabases (aggregate indicators for calculation, in particular, total indicators, total size of the target population, sampling error, confidence interval etc., and the method for calculating them) Software, syntax and batch to calculate aggregates from microdatabase, merge databases and create databases
	5.8 Finalize data files	Criteria and rules for finalizing data files
6. Analysis	6.1 Prepare output design	Output tables and variables entering their rows and columns, method for determining values Software and syntax for creating result table Rule and method for creating statistical charts (statistical charts, their types, variables and dimensions) Software and syntax for creating statistical charts Method for detecting and eliminating seasonal effects in the time series of results, and modifying the time series Software and syntax for detecting and eliminating seasonal effects and modifying the time series Rule and method for updating tables in the time series of results Software and syntax for updating tables in the time series of results
	6.2 Review and validate the output	Rules and instructions for reviewing and checking the generated output (order and method of checking (check spelling, format, style, check with data from other sources by comparing, check the status of increase and decrease of the time series, check the logical relationship between indicators etc.), document their findings, and decide whether to include the results of the review and validation into the output)
	6.3 Interpreting the output	General rules and instructions for interpreting outputs and results within them (interpretation of outputs in terms of methodology and technique, and interpretation of results in outputs)
	6.4 Monitoring the protection of data confidentiality	Procedures and recommendations for ensuring data confidentiality
	6.5 Finalizing the output	Sequences and rules for finalizing the output
7. Dissemination	7.1. Update output systems	Software for loading data and information into the data dissemination system

		Prepare the data and structure to be loaded in compliance with the structure of the data dissemination system Prepare the metadata structure to be entered into the metadatabase
	7.2. Creating statistical products and services	Prepare templates of tables, charts, descriptive texts and methodological notes for regular printed products such as statistical bulletins, presentations and yearbooks etc. Prepare a customized survey report template Prepare templates for interactive tables, charts and infographics Downloadable tables, data and microdata structures for inserting on dissemination systems
	7.3. Dissemination schedule for statistical products and services	Prepare templates for advertising products to be disseminated using social media and email marketing
	7.4. Promoting statistical products and services	Prepare templates for promoting dissemination of statistical products
	7.5. Manage user support	Create channels for collecting user feedback and demands concerning dissemination products, and enter them into the system to communicate with users.

3.5 Testing elements to be used in statistical processes

In this sub-process, check whether the necessary modifications and changes have been made, operate them, detect discrepancies and make changes and improvements on implementation of actions such as the creation of software, systems and applications to be used in steps, starting from “4. Collect” phase and ending with “7. Disseminate” phase, as designed in the sub-process “2.6 Determine the statistical business process model”. In this sub-process, the following checks and improvements shall be performed:

1. Check if the data collection tool is complete. Check whether the data collection tools or forms, instructions, manuals, data entry software have all been fully developed, whether the goals, requirements and specifications determined in the output specification are fully included etc., make necessary modifications and changes.
2. Check whether entered relevant data for the collection of statistical and survey data into the monitoring system of data collection process.
3. Check the functionality of the software and systems for data entry and collection
4. Check the functionality of the software for database check and maintenance.
5. Check the functionality of the data processing software.
6. Check the functionality of the data analysis software.
7. Check the functionality of the software for loading data and information into the data dissemination system.
8. Check whether prepared data and structure to be loaded in compliance with the structure of the data dissemination system, and whether the prepared structure conforms to the structure of the dissemination system.
9. Check whether prepared metadata structure to be entered into the metadatabase, and whether the processed structure conforms to the structure of the metadatabase.
10. Check whether prepared templates of tables, charts, descriptive texts and methodological notes for regular printed products such as statistical bulletins, presentations and yearbooks etc.
11. Check whether prepared templates for interactive tables, charts and infographics.

12. Check whether prepared downloadable tables, data and microdata structures for inserting on dissemination systems.
13. Check whether prepared templates for advertising statistical products & services to be disseminated using social media and email marketing.
14. Check whether prepared templates for promoting products and services of statistical data dissemination.
15. Check whether created channels for collecting user feedback and demands concerning dissemination products and services, and entered them into the system to communicate with users.

3.6 Fully testing the statistical business process model

In this sub-process, pilot enumerations, surveys and statistical data collection are conducted in the field, and check and verify that the statistical business process model is implemented as planned. After testing, there may be a need return to the previous phase and make improvements to the corresponding elements. For large statistical business processes, such as a population census, such test can be repeated several times until the satisfactory performance of statistical business process model is achieved.

In this phase of testing the statistical business process model, the tools and systems developed in "Build statistical business process model (3)" phase as per the design developed in "Design (2)" phase, are fully tested in live environment, and make the necessary improvements and make the model ready for implementation. It shall be implemented in the following order:

- Perform statistical reports, enumerations and surveys from start to finish on a reduced scale, and fully test the planned & developed method and overall system.
- Document errors and problems during testing; determine the requirements and extent of relevant improvements; and decide whether to make improvements.
- According to the decision, make relevant modifications and changes, decide whether to retest or not, and conduct retest if necessary.

3.7 Finalize the statistical business process model

This sub-process includes the activities to finalize the modified and newly-created elements, put them into statistical production system, and make them ready for use. The activities include:

- Make relevant improvements in the previous sub-process of testing the statistical business process model.
- Review, complete and finalize the plans, tools, systems, software and relevant documents created in the previous sub-process.
- In connection with the implementation of the created plans, tools, systems and software, prepare manuals and training materials for users, and organize trainings and meetings, if necessary.
- Archive and document the registered documents and materials according to appropriate guidelines.

4. Data collection:

This phase collects or gathers all necessary information (data and metadata), using different collection modes (including methods of extraction from statistical, administrative and other non-statistical records and databases), and loads them into the appropriate environment for further processing. Whilst it can include

validation of the structure of the database, it does not include any transformations of the data (edit & impute etc.). Because ,these are all done in the “Process” phase. For statistical outputs produced regularly, this phase occurs in each iteration.

4.1 Create a frame and select sample

This sub-process establishes the frame and selects the sample for this iteration of the collection, as specified in sub-process 2.4 (Design frame and sample). Quality assurance and approval of the frame and the selected sample are also undertaken in this sub-process.

This sub-phase to draw the sample frame from the relevant sources as per the sample design and conduct the sampling is performed in the following order:

- Prepare a sampling frame subject to the key indicators specified in the registration database defined in the sampling design

- Check whether there are any irrelevant units or duplicates within the sampling frame, and whether the value of the indicator to be used for sampling is complete
- Enter identifiers into the sampling software and sample with the software
- Review the sampling list and make relevant checks and clarifications (whether the unit covered in other report or survey has been selected, etc.), if necessary, replace with resource; and finalize the sampling list and make it ready for use in data collection.

4.2 Prepare for data collection

In this sub-process, check the human resources, elements and technologies used for data collection to ensure that they are ready for collecting data and metadata at the planned level, and conduct the necessary preparations. It takes some time as it involves planning for data collection and training activities. In case of regularly repeated statistical business processes, some (or all) of these preparatory operations may not be required for each iteration. For revised and new statistical business processes, these activities can take much time.

For non-survey sources, this sub-process includes reviewing and verifying that the necessary confidentiality systems and procedures are in place to obtain and retrieve the required data from the source.

This phase covers the following activities:

- Develop a data collection plan.
- Develop a preparatory work plan and a checklist for its execution based on the data collection plan.
- Perform preparatory works, verify and document completion using a performance checklist.
- Print and prepare documents such as survey and report forms used for data collection, instructions for completing them, and official letters to respondents.
- Prepare training materials for the data collection team and train them.
- Install the data entry software and test their functionality.
- Document the results of the preparatory work and upload it to the database.

4.3 Implement data collection

This sub-process collects raw microdata, and implements processes to gather data from databases in other sources. It include the initial contact with data providers and any subsequent follow-up or reminder actions. It may include the activity of manually entering the collected data into a database, depending on the source of the data and the method of data collection. Moreover, record and document the progress of data collection, when and how data providers were contacted, and whether they have responded. This sub-process also includes the management of the data providers involved in the current enumeration or survey, ensuring that the relationship between the statistical organization and data providers remains positive, and recording and responding to comments, queries and complaints. For administrative or other non-statistical sources, this sub-process is brief and defines the requirement that the data provider is either contacted to send the information or sends it as scheduled. When the data collection meets its targets or enumeration, survey and reporting units are fully covered, it is closed and a report on the data collection is produced. Some basic validation of the structure and integrity of the information received may take place within this sub-process, e.g. checking that files are in the right format and contain the expected fields. Validation of the content takes place in the Process phase.

Perform the data collection activities in a scheduled time, monitor the progress of performance and data quality, and take necessary actions. This sub-process shall be implemented in the following order:

- The list of units for report & survey, names of SME and employees to obtain information from that unit, and documents used for data collection etc. shall be entered beforehand into the system for monitoring and managing data collection process.
- The system for monitoring and managing data collection process determines the period and method for obtaining survey and data collection.
- Data will be collected using a phased data collection method, including the first, Computer-assisted web interview (CAWI); then, Computer assisted telephone interview (CATI) for contacting with respondents who did not submit their data online within a specified time period; and face-to-face Paper & pencil personal interview (F2F-PAPI) for sending data collection staff to respondents who could not be reached by phone etc.
- In the event that data is collected through paper questionnaires or forms, gather completed questionnaires and forms, and type them into the database with data entry software.
- Check incoming information and typed information, get the necessary clarifications, and enter & document relevant corrections and clarifications into the database.

4.4 Finalize data collection

This sub-process includes loading the collected data and metadata into a suitable electronic environment for further processing. It may include manual or automatic data capture, for example, using clerical staff or optical character recognition tools to extract information from paper questionnaires, or converting the formats of files or encoding the variables received from other organizations. It may also include analysis of the metadata (paradata) associated with collection to ensure the data collection activities have met requirements. For paper questionnaires and forms, which is not needed for further processing, this sub-process manages the archiving of that material.

This sub-process analyzes the results of the data collection activities, finalizes the data collection activities, and performs the data transfer activities to the next phase. It shall be implemented in the following order:

- After the scheduled data collection period, prepare, document and archive the data collection report using the system for monitoring and managing data collection process. Thus, obtain, document and archive information such as the number and list of units included in data collection, the number and list of excluded units, and the reasons for exclusion from data collection etc.
- Manage and archive paper questionnaires and forms. Enter the information, such as the creation date of the archive unit, its retention period and deletion date etc., into the system for monitoring and managing data collection process.

5. Data processing:

This phase describes the editing the data and their preparation for analysis. This phase consists of sub-processes for checking and editing data, transforming it into data input, and thus, these data will be analyzed and disseminated as statistical outputs. This phase can be repeated several times, if necessary. 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 (with the possible exception of sub-process 5.6 (Calculate weights), which is usually specific to survey data).

The “Process” and “Analyze” phases can be iterative and parallel. Analysis can reveal a broader understanding of the data, which might make it apparent that additional processing is needed. Activities within the “Process” and “Analyze” phases may also commence before the “Collect” phase is completed. This enables the compilation of provisional results where timeliness is an important concern for users, and increases the time available for analysis.

5.1 Integrate data

In this sub-process, the data collected from various units or sources in the “Data collection” phase is used to create an integrated database.

Data integration may take place at any point in this phase, before or after any of the other sub-processes. There may also be several instances of data integration in any statistical business process. Depending on data privacy requirements, identifying data such as name and address may be anonymized to maintain privacy once the data is aggregated.

This data integration sub-process can be implemented in the following situation. It includes:

- Integrate a given iterative database into a previously created dynamic or time-series database.
- Integrate one or more databases retrieved from other sources into the main database

Data is integrated in the following order:

- Compare and integrate the structure of each database to be merged - define a variable specifying the integration rules and merging keys
- Integrate databases with a data integration software.
- Document and register whether inconsistent or unrelated data occurred during the integration process, whether there is a difference in the structure of the database, and how those issues were resolved.
- Review and validate the created database structure

5.2 Classify and code

This sub-process classifies and codes the input data. For example, automatic (or manual) coding routines may assign numeric codes to text responses according to a pre-determined statistical classification.

The purpose of this sub-process is to classify and code open-ended responses in statistics and survey databases, if they are exist, and make the data ready for analysis. The result is a coded database.

This sub-process shall be implemented in the following order:

- Review the open-ended response fields and determine whether and to what extent standard classifications and previously defined category coding can be used.
- Determine coding rules and methods for classifying open-ended response fields, and prepare a list of classification code
- Determine whether the activity to be coded should be coded manually or automatically based on the coding rules and methods for classifying open-ended response fields and the list of classification codes,
- Develop software and syntax to code open-ended response fields automatically,
- Manually or automatically code the field according to the developed rules and methods, and the list of classification codes,
- After implementing the first stage of coding, reconsider the remaining uncoded open-ended responses, and update the coding rules and methods, and the list of classification codes,
- Recode in accordance with the updated coding rules and methods, and the list of classification codes. Repeat the above actions, if necessary,
- Document and record the above actions,
- Load the coded database into the microdatabase.

5.3 Review & validate

This sub-process examines data to identify potential problems such as outliers, item non-response and miscoding. It can also be referred to as input data validation. It may be run iteratively, validating data against pre-defined edit rules, usually in a set order. It may flag data for automatic or manual inspection or editing. Reviewing and validating can apply to data from any type of source, before and after integration. Whilst validation is treated as part of the “Process” phase, in practice, some elements of validation may occur alongside collection activities, particularly for modes such as web collection. Whilst this sub-process is concerned with detection of actual or potential errors, any correction activities that actually change the data are done in sub-process 5.4.

This sub-process performs data review & validation for statistical parameters and time series.

1. Review & validate data for statistical parameters. It aims at detecting statistical parameter errors in the database, such as outliers, item non-response and miscoding etc. By implementing it, you will get a list and definition of statistical parameter errors in the database. It shall be implemented in the following order:

- Define the rules and methods for detecting errors in statistical parameters based on the testing rules for the data entry software and variable definitions.
- Based on the rules and methods for detecting errors in statistical parameters, check for this type of model in the previously developed parameter error detection software, syntax and batch databases.

- Prepare an error detection software that implements given rules and methods using the software, syntax and batch identified as similar.
- Create a list of errors for each type of error using the prepared software.
- Document and enter the list of errors into the database.

2. Review and validate data for time series. It focuses on identifying time series errors in the database. The result is a list and definition of time series errors in the database. It shall be implemented in the following order:

- Define rules and methods for fault detection in time series.
- Based on the rules and methods for detecting errors in time series, check for this type of model in the previously developed time series error detection software, syntax and batch databases.
- Prepare an error detection software that implements given rules and methods using the software, syntax and batch identified as similar.
- Create a list of errors for each type of error using the prepared software.
- Document the list of errors and load them into the relevant databases and metadatabases.

Time series errors include the value of certain parameters and variables of a given unit included in the database grown or declined markedly since the previous period; considerations where the data of the unit that did not exist before or the data of the unit that exist before is not entered; and it is defined in the rules and methods for fault detection in time series.

5.4 Edit & impute

Where data are considered incorrect, missing or unrealistic, new values may be inserted in this sub-process. The terms editing and imputation cover a variety of methods to do this, often using a rule-based approach. Typically include the following specific steps:

- Determine whether to add or change data;
- Select the method to be used;
- Add/change data values;
- Write the new data values back to the data set, and flag them as changed;
- Produce metadata on the editing and imputation process.

1. Edit data. Clarify the error status defined in the previous phase (5.3), and make necessary corrections and create an error-free database. The result is a corrected and error-free database. It shall be implemented in the following order:

- Based on the list of known errors, develop the rules and methods for clarifying and correcting errors. Such rules and methods will describe whether to clarify from the respondent, whether to check against other sources, record and document the results of clarification, specify the sequence and instructions on how to perform the corrections etc.
- Make a clarification as per the developed rules and methods, and record & document the results of clarification.
- Based on the conclusion and interpretation of clarification, decide how to perform the corrections, and record and document it.
- Make the specified corrections manually or automatically using a software.

- On the edited database, run the error detection software defined in the previous phase and create a list of errors.
- Comparing the results of the checks on the edited database against the results of the clarification, and decide whether to re-correct or leave it uncorrected.
- If the re-correction is decided as necessary, re-correct it.
- Create and document a list of blank or missing values from the uncorrected section.
- Decide whether to impute the edited database or not.
- If it is decided not to conduct imputation, transfer the edited database to the Analyze phase. If it is decided to conduct imputation, implement the next statistical task.
- Document the information such as identified errors, and how they are clarified and corrected etc.

2. Imputing blank or missing values. The goal is to impute blank or missing values in the statistics and survey database. Consequently, a complete database is created by imputation. It shall be implemented in the following order:

- Develop rules and methods for imputation. Such rules and methods include standard approaches such as (hot deck, cold deck and mean substitution) regression imputation etc.
- Develop software, syntax and batch for implementing the imputation operation according to determined rules and methods.
- Run the imputation software, syntax and batch to implement the imputation operation, and create complete survey and statistics database.

5.5 Derive new variables & units

This sub-process derives new variables and units from the data that were not found during data collection but are necessary to obtain the required results. It derives new variables by applying arithmetic formula to one or more of the variables that are already present in the dataset, or applying different model assumptions. This activity may need to be iterative, as some derived variables may themselves be based on other derived variables. It is therefore important to ensure that variables are derived in the correct order. New units may be derived by aggregating or splitting data for collection units, or by various other estimation methods. Examples include deriving households where the collection units are persons, or enterprises where the collection units are legal units.

1. Derive new variables. The of this sub-process is to derive or produce new variables that are not provided in the collection, but are needed to deliver the required outputs. This will create a database with newly derived variables. It shall be implemented in the following order:

- Define the variables that need to be derived based on the list of outputs and products as a result of statistical business processes, the list of their variables and their definitions.
- Develop rules and methods for deriving and creating new variables. These rules and methods include techniques for obtaining new variables and their values through arithmetic operation and regression equation.
- Develop software, syntax and batch for deriving and producing new variables according to determined rules and methods.
- Create survey and statistics database with new variables by running the software, syntax and batch for deriving and creating new variables.

- Add newly derived variables to the database of statistical classifications and variables.

2. Derive new units. The purpose of this operation is to produce new units that are not provided in the collection, but are needed to deliver the required outputs. This will retrieve the database at the level of the produced new unit. It shall be implemented in the following order:

- Define the units that need to be derived based on the list of outputs and products as a result of statistical business processes, the list of their variables and the level of accuracy definitions.
- Develop rules and methods for creating new units. Statistical units, their definitions and relationships are defined in these rules and methods.
- Develop software, syntax and batch for deriving and producing new variables according to determined rules and methods.
- Create survey and statistics database with new variables by running the software, syntax and batch for deriving and creating new variables.
- Add newly derived variables to the database of statistical classifications and variables.

5.6 Impute sampling weights

This sub process creates weights for unit data records according to the methodology created in sub-process 2.5 (Design processing and analysis). In the case of sample surveys, weights can be used to "gross-up" results to make them representative of the target population. In other situations, variables may need weighting for normalization purposes.

In this sub-process, based on the results of data collection, perform the actions such as adjusting the sample weights, recalculate the sample weights, and enter the sample weights into the database etc. It shall be implemented in the following order:

- Define rules and methods for adjusting sampling weights and entering sampling weights in the database
- Develop software, syntax and batch for calculating the sampling weight and entering the sampling weight into the database according to determined rules and methods.
- Adjust the sampling weight based on the list of units and description of reasons not included in the results of the data collection and surveying, in other words, the sampling weight is recalculated manually or automatically.
- Enter the calculated sampling weight into the database using the appropriate software, syntax and batch.

5.7 Calculate aggregates

This sub-process creates aggregate data and population totals from micro-data or lower-level aggregates (integrated), and enters such data into the database. It includes summing data for records sharing certain characteristics, determining measures of average and dispersion, and applying weights from sub-process 5.6 to derive appropriate totals. In the case of sample surveys, sampling errors may also be calculated in this sub-process, and associated to the relevant aggregates.

In this sub-process, calculate aggregates based on the microdatabase, merge them into the database, and create separate database for aggregates. It shall be implemented in the following order:

- Determine the rules and methods for calculating aggregates from the microdatabase. Specify the aggregates to be calculated, total indicators, total size of the target population, sampling error, confidence interval etc., and the method for calculating them.
- Develop software, syntax and batch to calculate aggregates from microdatabase, merge databases and create databases
- Calculate aggregates, merge them into the database and create database for aggregates.

5.8 Finalize data files

This sub-process brings together the results of the other sub-processes in this phase and results in a data file (usually of macro-data), which is used as the input to the "Analyze" phase. Sometimes this may be an intermediate rather than a final file, particularly for business processes where there are strong time pressures, and a requirement to produce both preliminary and final estimates.

This sub-process finalizes the microdata file and makes it ready for analysis. Check the data file as per the criteria and rules for finalizing data files. At the same time, confirm that the data file has been reviewed in accordance with steps 5.1-5.7. If necessary, return to a given step and repeat the required action. Check and validate the data file as per the criteria for finalizing data files and make it ready for analysis.

6. Analyze:

In this phase, statistical outputs are produced, examined in detail and made ready for dissemination. It includes preparing statistical content (including commentary, technical notes, etc.), and ensuring outputs are "fit for purpose" prior to dissemination to customers. This phase also includes the sub-processes and activities that enable statistical analysts to understand the statistics produced. For statistical outputs produced regularly, this phase occurs in each iteration. The "Analyze" phase and sub-processes are generic for all statistical outputs, regardless of how the data were sourced.

6.1 Prepare output design

This sub-process is where the data are transformed into statistical outputs. It includes the production of additional measurements such as indices, trends or seasonally adjusted series, as well as the recording of quality characteristics.

This sub-process is where the data are transformed into statistical outputs. It includes the production of additional measurements such as indices, trends or seasonally adjusted series, as well as the recording of quality characteristics.

1. Prepare the result tables needed for the statistical products from the database. It shall be implemented in the following order:

- It includes the output table and variables entering their rows and columns, method for determining values etc.
- Develop software and syntax for creating result tables as per the rules and methods for creating result tables.
- Create result tables, make necessary corrections, and enter into the database of statistical products.

2. Create statistical charts. Prepare the charts needed for the statistical products from the database. It shall be implemented in the following order:

- Define the rules and methods for creating statistical charts (policy tasks). Define statistical charts, their types, variables and dimensions etc.
- Develop software and syntax for creating charts in accordance with the rules and methods for creating charts.
- Create charts, make necessary corrections, and enter into the database of statistical products.

3. Eliminate seasonal effects in the time series of results. Integrate the results of a given iteration with the time series of results for a period starting from the production of that type of statistics, and update the time series of results. This operation shall be implemented in the following order:

- Determine the method for detecting and eliminating seasonal effects in the time series of results, and modifying the time series
- Develop software and syntax for detecting and eliminating seasonal effects and modifying the time series as per the rules and methods for detecting and eliminating seasonal effects in the time series of results, and modifying the time series.
- Detect and eliminate seasonal effects, modify the time series, and enter into the database of statistical products.

4. Create time series of results. This step detects and eliminates seasonal effects in the time series and modifies the time series. This creates time series tables of results with eliminated seasonal effects. It shall be implemented in the following order:

- Determine the rule and method for updating tables in the time series of results
- Develop software and syntax for updating tables in the time series of results as per the rules and methods for updating tables in the time series of results.
- Update tables in the time series of results, make necessary corrections, and enter into the database of statistical products.

6.2 Review and validate the output

This sub-process is where statisticians validate the quality of the outputs produced, in accordance with a general quality framework and with expectations. This sub-process also includes activities involved with the gathering of intelligence about a specific statistical domain. This knowledge is then applied to the current collection, in the current environment, to identify any divergence from expectations and to allow informed analyses. Review and validation activities include:

- check that the population coverage and response rates are as required;
- compare the statistics with previous cycles (if applicable);
- check that the associated metadata and paradata (process metadata) are present and in line with expectations;
- confront the statistics against other relevant data (both internal and external);
- investigate inconsistencies in the statistics;
- perform macro editing;
- validate the statistics against expectations and domain intelligence.

In this phase, the results created in sub-process 6.1 are analyzed, verified and prepared for presentation. Validated outputs include results tables, charts, time series tables of updated results, and time series tables of results with eliminated seasonal effects etc. It shall be implemented in the following order:

- Develop rules and instructions for reviewing and validating produced output. These rules and instructions will cover order and method of validation (check spelling, format, style, check with data from other sources by comparing, check the status of increase and decrease of the time series, check the logical relationship between indicators etc.), documenting their findings, and deciding whether to include the results of the review and validation into the output etc.
- Perform review and verify activities as per the sequence, and document the results, according to the rules and instructions for reviewing and validating produced output.
- Analyze the problems identified during the "review & validate" process and determine ways to solve them.
- Solve problems and make necessary corrections in accordance with the determined solutions.
- Enter the corrected output into the statistical output database.

6.3 Interpreting the output

This sub-process is where the in-depth understanding of the outputs is gained by statisticians. They use that understanding to interpret and explain the statistics produced for this cycle by assessing how well the statistics reflect their initial expectations, viewing the statistics from all perspectives using different tools and media, and carrying out in-depth statistical analyses.

Here, reviewed & validated outputs in sub-process 6.2 will be described and prepared for releasing statistical products to be disseminated. It shall be implemented in the following order:

- Develop and apply common rules and instructions for interpreting outputs and results within them. General rules and instructions for interpreting outputs and results within them consist of 2 sections including the interpretation of outputs in terms of methodology and technique, and interpretation of results in outputs.
- First, prepare the methodical technical description and presentation of the output based on the above general rules and instructions, as well as, the descriptive presentation used in previous iterations and similar statistics, and the descriptive metadata of the methodology and technical description in the previous phases and sub-processes.
- Then, the output results will be interpreted using descriptive analysis and time series analysis etc., the pre-made models.
- For descriptions and presentations, conduct wording and sample design; for numerical data, perform "review and validate" activities; and document the results.
- For errors and problems detected during the "review & validate" process, the corresponding corrections and changes are documented in the descriptions and presentations file.
- Enter the corrected descriptions and presentations into the statistical output database.

6.4 Monitoring the protection of data confidentiality

This sub-process ensures that the data (and metadata) to be disseminated do not breach the appropriate rules on confidentiality. This may include checks for primary and secondary disclosure, as well as the application of data suppression or perturbation techniques. The degree and control of data protection may vary for

different types of outputs. For example, the approach used for micro-data sets for research purposes will be different to that for published tables and maps.

Common procedures for ensuring confidentiality of data in statistical products will be developed and implemented. This procedure falls into two parts, including, ensuring confidentiality of information in outputs and their descriptions and presentations; and ensuring data privacy in microdata files.

1. Monitoring the protection of data confidentiality for statistical outputs. In accordance with pre-defined data confidentiality procedures, check whether the statistical output, the information and data contained in it are consistent with the regulation, and make the necessary changes. It shall be implemented in the following order:

- Common procedure for ensuring confidentiality of data in statistical products specifies the type and definition of data necessary to ensure confidentiality in the information contained in the outputs, their descriptions and presentations; in case of this type of information is contained, the methods for ensuring information confidentiality etc.
- Clarify whether the produced statistical output and its descriptions and presentations contain information related to confidentiality, determine the type of information and take the necessary measures.
- Document the created outputs after implementing measures and relevant actions to solve identified issues related to information confidentiality.
- Enter the information confidentiality ensured output into the statistical output database.

2. Monitoring the protection of data confidentiality for statistical microdata. In accordance with pre-defined data confidentiality procedures, check whether the statistical output is consistent with the regulation, make the necessary changes, and prepare microdata files for delivery to users for analysis. It shall be implemented in the following order:

- Specify descriptions and presentations of the confidentiality ensuring information contained in the microdata file; in case of this type of information is contained, the methods for ensuring information confidentiality etc.
- Clarify whether the microdata files contain information related to confidentiality, determine the type of information and take the necessary measures. It can be done automatically or manually using prepared template, software and syntax.
- Document the microdata files after implementing measures and relevant actions to solve identified issues related to information confidentiality.
- Enter the information confidentiality ensured output into the statistical output database.

6.5 Finalizing the output

This sub-process ensures the statistics and associated information are fit for purpose and reach the required quality level, and are thus ready for use. The activities include:

- complete consistency checks;
- determine the level of release, and applying caveats;
- collate supporting information, including interpretation, commentary, technical notes, briefings, measures of uncertainty and any other necessary metadata;
- produce the supporting internal documents;

- pre-release discussion with appropriate internal subject matter experts;
- approve the statistical content for release.

Check the output according to the sequences and rules for finalizing the output. This step shall be implemented in the following order:

- finalize “Review and validate the output” task;

- determine the level of data release, and apply caveats;

- collate supporting information, including interpretation, commentary, technical notes, briefings and any other necessary metadata;

- produce the supporting internal documents;

- conduct pre-release discussion with appropriate internal subject matter experts;

- approve the statistical content for release.

At the same time, confirm that the outputs have been reviewed in accordance with steps 6.1-6.4. If necessary, return to a given step and repeat the required task. Review & validate the output according to the sequences and rules for finalizing the output, and make dissemination products ready for production.

7. Dissemination:

This phase manages the release of the statistical products to customers. It includes all activities associated with assembling and disseminating a range of static and dynamic products via a range of channels.

7.1 Update output systems

This sub-process manages the update of systems where data and metadata are loaded and stored ready for dissemination purposes. It includes:

- format data and metadata ready to be put into output databases;
- load data and metadata into output databases;
- ensure data are linked to the relevant metadata.

Formatting, loading and linking of metadata should preferably mostly take place in earlier phases, but this sub-process includes a final check that all of the necessary metadata are in place ready for dissemination.

In this phase, download all relevant databases and metadata intended for dissemination to external users from their respective sources, check for integrity and up-to-date, and load them to the Data Dissemination System (DD System). As a result, outputs linked to databases and metadata loaded into the dissemination system, or user-accessible elements in the Data Dissemination System. It shall be implemented in the following order:

- In accordance with the GSBPM, determine the level at which the database and metadata, created in the previous phases and sub-processes, will be used and disseminated. In particular, decide at what

level data will be disseminated to users inside the statistical organization and outside the statistical organization.

- Download all relevant databases and metadata intended for dissemination to external users from their respective sources, check for integrity and up-to-date, and load them to the Data Dissemination System (DD System). Data Dissemination System includes the Integrated Statistical Database (www.1212.mn), Database of Statistical Methodology (http://web.nso.mn/aazms/), Enumeration and Survey Catalogue (http://web.nso.mn/nadamn/index.php/catalog/central/about), Census Database (http://arcgis.nso.mn/census/), National Demographic Atlas (http://web.nso.mn/population_atlas/) and production of dissemination products.
- Assess the elements, loaded to the data dissemination system, against open data criteria (unrestricted access, ease of use and download, and machine-readable electronic format).

7.2 Create statistical products and services

This sub-process produces the products, as previously designed (in sub-process 2.1), to disseminate to users. They could include printed publications, press releases and web sites. The products can take many forms including interactive graphics, tables, public-use micro-data sets and downloadable files. In this sub-process, the following actions shall be performed:

- prepare the product components (descriptive texts, tables, charts, infographics and quality statements etc.);
- assemble the components into products;
- edit the products and check that they meet publication standards.

1. Produce printed dissemination products. Prepare and integrate product components to create preprints and make them ready for data dissemination. The printed dissemination products include periodic statistical data presentations, bulletins, yearbooks, thematic presentations, infographics, preprints, their websites, and files in formats such as PDF for CD-ROM etc. Develop and implement procedure for producing printed dissemination products. The procedure includes the following:

- Types of printed dissemination products: monthly statistical presentations, yearbooks and thematic reports etc.
- Content, structure and components of all types of printed dissemination products,
- General requirements for template format and components,
- Production sequence, review & validation, and finalization rules for printed dissemination products etc.

According to the procedure, download and load the components of the printed dissemination products from relevant sections, and develop a software for performing the corresponding calculations and changes automatically.

Produce preprints of printed dissemination products using the software;

review & validate the draft version, make necessary corrections and changes, and finalize. By finalizing the draft version of dissemination products, transfer the preprint to the publication, create an electronic version and upload it to the data dissemination system.

2. Produce non-printed dissemination products. This step produces and disseminates non-printed dissemination products via data dissemination systems (websites and social media etc.).

Develop and implement procedure for producing non-printed dissemination Busu products. The procedure includes the following:

- Types of non-printed dissemination products: downloadable statistical tables, data and microdatabases etc.
- Content, structure and components of all types of non-printed dissemination products,
- General requirements for template format and components
- Production sequence, review & validation, and finalization rules for non-printed dissemination products etc.

According to the procedure, download the components of the printed dissemination non-products from relevant sections, and develop a software for uploading them to data dissemination systems and websites automatically.

Produce preprints of non-printed dissemination products using the software; review & validate the draft version, make necessary corrections and changes, and finalize. By finalizing the draft version of dissemination products, transfer the preprint to the publication, create an electronic version and upload it to the data dissemination system.

7.3 Manage release of dissemination products and services

This sub-process considers the timing and form of dissemination of statistics. It includes briefings for specific groups such as the press or government organizations, as well as the arrangements for any pre-release embargoes. It also includes the provision of products to subscribers, and managing access to confidential data by authorized user groups, such as researchers. Sometimes an organization may need to retract a product, for example if an error is discovered. This is also included in this sub-process.

This sub-process announces the release of the dissemination product to users according to a press release date. It shall be implemented in the following order:

- Schedule a press release date in the design phase, and post on the organization's website.
- Develop and implement the procedure for announcing press release date and communicating with users.
- According to the procedure, announce the press release date through the specified channels and with the specified content.
- Measure, document and record the results of announcement of the press release date by a number of visitors to the website & social media pages, and feedback received from them etc.

7.4 Promote statistical products and services

Whilst marketing in general can be considered to be an over-arching process, this sub-process concerns the active promotion of the statistical products produced in a specific statistical business process, to help them reach the widest possible audience. It includes the use of customer relationship management tools, to better target potential users of the products, as well as the use of tools including websites, wikis, blogs and social media to facilitate the process of communicating statistical information to users.

This sub-process is aimed at promoting the dissemination product among customers and increasing the product consumption. Consequently, the number of users has increased by planning & implementing activities to promote statistical products and services, as well as, creating and using promotional materials. It shall be implemented in the following order:

- Develop and implement general recommendations for promoting dissemination products.
- Prepare promotional materials for statistical products and services, according to the recommendations, using previously developed advertising content templates, and disseminate through available channels.
- Host events and activities to promote statistical products and services.
- Measure, document and record the results of promotion of statistical products and services by a number of visitors to the website & social media pages, and feedback received from them, number of participants in organized events, and the number of newly registered users etc.

7.5 Manage user support

This sub-process ensures that customer queries and requests for services such as micro-data access are recorded, and that responses are provided within agreed deadlines. These queries and requests should be regularly reviewed to provide an input to the over-arching quality management process. Thus, these queries and requests can indicate new or changing user needs.

Manage user support (7.5) sub-process is aimed at receiving feedback and comments from users on statistical products and services, and increasing the consumption of that product or service by responding to them. It shall be implemented in the following order:

- Develop and implement general guidelines for collecting and responding user feedback and demands concerning statistical products and services.
- According to the guideline, analyze received feedback and demands, and respond within the specified due date.
- Record and document information such as unresolved feedback and demands, their reasons and interpretations, and decision on whether to consider it further etc.
- Measure, document and record the results of customer relations by percentage of unresolved feedback and demands, and time elapsed since the last feedback etc.

8. Evaluate:

This phase manages the evaluation of a specific instance of a statistical business process, as opposed to the more general over-arching process of statistical quality management described in Section VI, GSBPM 5.0. It logically takes place at the end of the instance of the process, but relies on outputs of previous phases. It includes evaluating the success of a specific instance of the statistical business process, gathering quantitative and qualitative inputs, and identifying and prioritizing potential improvements.

8.1 Gather evaluation inputs

Evaluation material can be produced in any other phase or sub-process. It may take many forms, including feedback from users, process metadata (paradata), system metrics, and staff suggestions. Reports of progress against an action plan approved during a previous iteration may also form an input to evaluations of subsequent

iterations. This sub-process gathers all of these inputs, and makes them available for the person or team producing the evaluation.

Gather evaluation inputs (8.1) sub-process gathers evaluation input data, and prepares for evaluation. It shall be implemented in the following order:

- Determine criteria for evaluating input data. The quality criteria for each sub-process are included directly in the evaluation input database.
- Gather evaluation input data from relevant databases and metadata, and create an evaluation input database.

8.2 Conduct evaluation

This sub-process analyzes the evaluation inputs and synthesizes them into an evaluation report. The resulting report should note any quality issues specific to this iteration of the statistical business process. Make recommendations for changes, if necessary. These recommendations can cover changes to any phase or sub-process for future iterations of the process, or can suggest that the process is not repeated.

This sub-process of evaluation conducts evaluation based on the evaluation input data, and develops conclusions and recommendations. It shall be implemented in the following order:

- Retrieve data indicators or proposed indicators and performance indicators in the evaluation input database.
- Classify and consider input data indicators of evaluation by significance, effectiveness, efficiency and stability etc. Evaluate the performance indicators according to the classifications of evaluation indicators.
- Compare proposed indicators against performance indicators, and conduct evaluation and conclusion.
- Based on the evaluation conclusions, develop recommendations for the next iteration.

8.3 Agree an action plan

This sub-process brings together the necessary decision-making power to form and agree an action plan based on the evaluation report. It should also include consideration of a mechanism for monitoring the impact of those actions, which may, in turn, provide an input to evaluations of future iterations of the process.

This sub-process develops and agrees action plans for further implementation based on evaluation conclusions and recommendations. It shall be implemented in the following order:

- Develop action plans for further implementation based on evaluation conclusions and recommendations. Clearly indicate which phase and which sub-process of the next iteration are applicable to each implementation action.
- Evaluate the feasibility, importance and scalability of improvement activities in the developed plan, make further improvements, and discuss the draft action plan at the respective unit level.
- Reflect and finalize the recommendations from the discussion in the action plan, and make arrangements to implement the plan.

4. Common guidelines for implementation of phases and sub-processes of GSBPM at the local statistical offices:

The implementation order of the phases and sub-processes of the GSBPM is subject to changes to be made in the structure and system of the national statistical organization, the Law on Statistics and other laws and regulations.

Article 11.2 of the Law of Mongolia on Statistics states that "The statistical body of Mongolia shall consist of the National Statistical Commission, which is in-charge of co-ordination of all official statistical activities and functions in Mongolia independently, and its statistical departments and divisions at the Governors of provinces, capital city and districts." The local statistical organization includes statistical departments and divisions of provinces, capital city and districts. Thus, "local statistics" refers to statistics provided at the level of administrative divisions or province, capital city, soum, district, bagh, and khoroo.

1. Identify needs:

The local statistical organization is obliged to organize the official statistical data collection activities defined by the NSO at the local level, supply data to the NSO, as well as, compile and provide statistical data needed by local policy makers. Thus, for local statistical organizations, the need for statistical data is divided into the following 3 groups.

Table 20: Statistical data needs for local statistical organizations

#	Data needs	User type	Use and purpose of data
1	Needs to collect official statistics in the respective local area, and provide them to the NSO	National Statistics Office	Compilation of official statistics and surveys
2	The need for official statistics to be produced at the local level or administrative units, and used for survey & analysis.	Local statistical organizations, local policy makers, local enterprises, governmental and non-governmental organizations, projects and programs of international organizations and researchers	Release official statistical bulletins, presentations and yearbooks at the local level, as well as, perform survey and analysis at the local level.
3	Administrative data necessary for planning & monitoring the implementation of policies and programs for regional & local development.	Local policy makers or local administrative and local self-governing bodies, and projects & programs of local non-governmental organizations and international organizations	Plan and monitor the implementation of local development policy plans, projects and programs

For the 3rd type of statistical data need from above, sub-processes such as identify needs; consult & confirm needs with the relevant parties; establish output objectives; identify concepts and definitions; check data availability; and use in statistical business process etc. shall be implemented according to the GSBPM, defined at the NSO level.

For the first 2 types of statistical data needs, prefers the demands, needs, concepts, definitions and methodologies determined at the NSO level or within the scope of national statistical sector. This principle will be observed in the next phase as well.

2. Design:

When implementing the "Design" phase at the level of the local statistical organization, each of the three common needs discussed in the preceding "Identify needs" phase is addressed specifically.

1. Official statistics to be collected at the local level and provided to the NSO. This step directly adheres to the sub-processes defined at the NSO level, including Output data (2.1), Variables (2.2), Data collection (2.3), Design frame and sample (2.4), Processing (2.5) and Determine the statistical business process model (2.6). In this step, only in the context of the production systems and operational flow planning, consider how to coordinate local statistical unit in compliance with common production systems and operational flow planning.

2. Producing official statistics at the administrative unit level and disseminating at the local level. Determined output (2.1), Variables (2.2) and Data collection plan (2.3) determined at the NSO level will be implemented.

For a local statistical organization, the Design frame and sample (2.4), Design processing and analysis (2.5) and Determine the statistical business process model (2.6) phases are determined in consultation with the NSO in a common way for all local statistical units.

Planning the sampling frame and sampling (2.4). The official statistics collected by the NSO will be divided into three classifications, including statistical reports, complete enumerations and sample surveys. For sample research, clarify whether the representativeness of sample can be calculated at the level of capital city, province, district and soum. Where the representativeness of sample can produce the survey results at a given level, the NSO has plans on how to make the calculation, release survey results at the level of administrative units, and return to the local statistical unit etc. Moreover, plan actions such as how to clarify the sampling list provided and sampled by the NSO, and submit proposals for necessary changes to the NSO etc.

Design processing & analysis (2.5). Activities such as installation, testing and ensuring functionality of software and systems for data entry & verification of official statistics, and their transmission to the NSO etc., are planned at the local level statistical organizations.

When planning the analysis, following considerations should be addressed with the NSO. It includes:

- Among official statistics, which data and indicators can be disseminated at the regional and local level,
- Which software is used for data processing and how to process it, and which calculations to made additionally besides, calculations performed by a standard software.

Determine the statistical business process model (2.6). This step describes, among official statistics, how to receive and release data & indicators for local level dissemination. Define the systems, methods, sequences and resources to be prepared at the local level statistical organization for the phases from data collection through to dissemination.

3. Administrative data to be created based on specific local statistical needs. For administrative data or the third type of statistical data, required for planning and monitoring the implementation of local development policies and projects, the Design phase will be determined based on the general guidelines of the GSBPM. In the next phases, the determination of the GSBPM will be based on general guidelines, hence, it is not considered in the next chapter.

3. Create statistical business process model**:**

When implementing the "Create statistical business process model" phase at the level of the local statistical organization, each of the three needs discussed in the preceding "Identify needs" phase is addressed specifically.

1. Official statistics to be collected at the local level and provided to the NSO. This step directly uses Creation of data collection tools (3.1) and Build or enhance process components (3.2), defined and produced at the NSO level.

Build or enhance dissemination components (3.3), defined and produced at the NSO level, is not applicable to the local statistical organization for this type of statistical business process. Moreover, the sub-processes including Modeling a statistical business process (3.4), Testing elements to be used in statistical processes (3.5) and Finalize the statistical business process model (3.7) will be performed at the NSO level, hence, local statistical organizations will not be involved in this sub-process.

For the sub-process Fully testing the statistical business process model (3.6), the local statistical organization will be involved, and the activities to be performed in this sub-process by the local statistical organizations are planned together with the NSO.

2. Producing official statistics at the administrative unit level and disseminating at the local level. This step directly uses Creation of data collection tools (3.1) and Build or enhance process components (3.2), defined and produced at the NSO level.

For the sub-process Build or enhance dissemination components (3.3), defined and produced at the NSO level, the local statistical organizations shall make a plan on how to disseminate data in accordance with the general guidelines of the GSBPM, based on its own resources.

4. Data collection:

Since the local statistical organizations directly implement the data collection activities, this phase is discussed in detail.

Create a frame and select sample (4.1). Although the sub-process Create a frame and select sample will be done at the NSO level, activities such as submitting the list of selected units or sampling units to the local statistical organization, making relevant clarifications, and creating new sampling frame etc. Thus, develop and follow general instructions and guidelines on how to clarify the sampling list.

Prepare for data collection (4.2). The local statistical organization will make the necessary arrangements for data collection in its area of responsibility at the local level.

This phase covers the following activities:

- Based on a common data collection plan, develop a work plan to collect a given type of statistical data at the local level.
- Develop a preparatory work plan and a checklist for its execution based on the data collection plan.
- Perform preparatory works, verify and document completion using a performance checklist.

- Print and prepare documents such as survey and report forms used for data collection, instructions for completing them, and official letters to respondents.
- Prepare training materials for the data collection team and train them.
- Install the data entry software and test their functionality.

Implement data collection (4.3). The local statistical organization will collect data in its area of responsibility at the local level.

Perform the data collection activities in a scheduled time, monitor the progress of performance and data quality, and take necessary actions. This sub-process shall be implemented in the following order:

- Plan data collection in accordance with a list of units for report & survey, timing and method in the system for monitoring and managing data collection process.
- Data will be collected using a phased data collection method, including the first, Computer-assisted web interview (CAWI); then, Computer assisted telephone interview (CATI) for contacting with respondents who did not submit their data online within a specified time period; and Face-to-face Paper & pencil personal interview (F2F-PAPI) for sending data collection staff to respondents who could not be reached by phone etc.
- In the event that data is collected through paper questionnaires or forms, gather completed questionnaires and forms, and type them into the database with data entry software.
- Check incoming information and typed information, get the necessary clarifications, and enter & document relevant corrections and clarifications into the database.

Finalize data collection (4.4). The local statistical organization shall collect data in its area of responsibility at the local level and submit the data to the NSO, once the data collection is completed.

This sub-process analyzes the results of the data collection activities, finalizes the data collection activities, and performs the data transfer activities to the NSO. It shall be implemented in the following order:

- After the scheduled data collection period, prepare, document and archive the data collection report using the system for monitoring and managing data collection process. Thus, obtain, document and archive information such as the number and list of units included in data collection, the number and list of excluded units, and the reasons for exclusion from data collection etc.
- Identify errors in the database, and make & document proper clarifications and corrections. Moreover, the NSO also provided clarifications and corrections.
- Manage and archive paper questionnaires and forms. Enter the information, such as the creation date of the archive unit, its retention period and deletion date etc., into the system for monitoring and managing data collection process.

5. Data processing:

When implementing the data processing phase, procedures, methods, software and systems determined by the NSO will be used. Thus, the GSBPM will be used as a guideline. For local statistical organizations, particular attention is paid to the following sub-process.

Classify and code (5.2). Open-ended responses will be coded in data collected through paper questionnaires and forms, and entered into a database at the local statistical organization. Within this scope, implement the following activities.

- Coding schemes or standard classifications of open-ended survey responses, and open-ended response codes and descriptions will be obtained from the NSO, and data collection & entry staff will be briefed and trained.
- Open-ended responses are manually coded on paper questionnaires and forms, and entered into a database manually. In some cases, open-ended responses are coded manually or automatically, after they have been manually entered into the database.
- Coding is documented and recorded.

Review & validate (5.3). Once statistics and survey data are manually entered, the database is checked & verified by the local statistical organization before it is submitted to the NSO. This sub-process uses general procedures, methods and software defined by the NSO. Run the data checker tool, generate an error protocol, make relevant clarifications according to the error protocol, and determine what corrections need to be made.

Edit & impute (5.4). Once the statistics and survey data are manually entered, the local statistical office will check and validate the database before sending it to the NSO, make appropriate corrections, and if there are no errors exist, the database will be transferred to the NSO. Modifications are documented and transferred to the NSO as part of the database.

Finalize data files (5.8). The data file is considered finalized, when responded to clarifications from the NSO, made corresponding modifications, and notified as there are no other clarifications or corrections.

6. Analyze:

When implementing the Analyze phase, procedure, methods, software and systems determined by the NSO will be used. Thus, the GSBPM will be used as a guideline.

When producing official statistics at the administrative unit level and disseminating at the local level, the analysis will be carried out as jointly planned with the NSO. Within this scope, implement the following activities:

- Among official statistics, analyze the data and indicators for local level dissemination. In this case, after the NSO confirms that the database is finalized, produce a results table and analyze the results using a software.
- For the sample survey, obtain and analyze the data disseminated by the NSO.
- When conducting the analysis, determine the common methods of analysis, such as comparing the national average with the local indicators; comparing with the performances of the capital city, other provinces and districts; and making comparisons at the upper-level administrative unit etc.

7. Dissemination:

When implementing the Dissemination phase, procedures, methods, software and systems determined by the NSO will be used. Thus, the GSBPM will be used as a guideline.

For the sub-process Build or enhance dissemination components (3.3), defined and produced at the NSO level, the local statistical organizations shall disseminate data in accordance with the general guidelines of the GSBPM, based on its own resources.

For the official statistics, the sub-process Manage user support (7.5) collects user feedback and demands concerning statistical products and services, and submits it to the NSO.

8. Evaluation:

For local statistical organizations, evaluation will be done as per the GSBPM on each of the three types of statistics discussed in the Identify needs phase.

For official statistics determined by the NSO, evaluation will be done with a focus on the implementation status of data collection and processing phases. In particular, evaluation will be done on timeliness, completeness and quality of data collection. Within this scope, assessments, conclusions and recommendations by the NSO will be considered.

Appendix: Example of GSBPM implementation for a specific statistical business process

Appendix 1: Statistical business process model of the population and housing census

Phases and sub-processes	As-Is Model and To-Be Model
1. Identify needs	
1.1 Identify needs	Determine sources for identifying needs, and identify needs from them: - Feedback and demands gathered from users via the data dissemination channels and SME in charge of data dissemination and customer relations: consider the requests to use the results of the previous Population and Housing Census (PHS) at a higher level of accuracy or the feedback and demands concerning the results and data of the previous or 2010 census, and identify needs that need to be addressed in the next census. - Feedback and demands in the process of announcing and promoting census results and communicating with users: Summarizing and considering the feedback gathered during special activities such as thematic discussions (held with government organizations such as the Ministry of Health, the Ministry of Education etc., and research institutes) aimed at announcing the results of the 2010 Population and Housing Census, organizing dissemination workshops, and supporting the use of certain groups of users. This sub-process considers data posted on the organization's website and informative pages, as well as the opinions given by users on them. - Needs arising from changes in the policy, program, organization, structure, and budget of the statistical sector: The National Strategy for Development of Statistics for 2017-2020: 2.1.4.1. Explore technology solutions for the 2020 Electronic Population and Housing Census (e-census), 2.6.18. Study and implement the Principles and Recommendations for Population and Housing Censuses (Revision 3) etc. - Needs arising from changes in the scope of legislations and development policies: **Mongolia Sustainable Development Vision 2030** (Parliament Resolution No. 19 of 2016): Objective 5. Improve the legal environment for urban and land development based on the extant population settlements and residential systems. **...**Provide high-speed Internet connection for 90 percent of the population, ensure that at least 70 percent of the rural populations use broadband Internet services... Plan state budget investment expenditure for social services in accordance with the needs of the population… ...increase life expectancy of the population to 78 years. Ensure that 90 percent of the population is supplied with safe drinking water, and 60 percent of the population uses improved sanitation and hygiene facilities etc. **State Policy on Population Development of the Government of Mongolia** (Parliament Resolution No. 21 of 2014): 4.1.4. Collect and process the statistical data necessary for reflecting the population factor in development plan, and create a system to deliver prospects and research results on needs and challenges to users. 4.1.5. Expand data and surveys disaggregated by sex etc. - Demands arising from changes in international methods and recommendations: “Principles and Recommendations for Population and Housing Censuses: Revision 3”, United Nations, 2014; “Conference of European Statisticians: Recommendations for the 2020 Censuses of Population and Housing”, UNECE, New York and Geneva, 2015 etc. Categorize and analyze needs, and decide whether to consider the need further: Given the need to “Explore technology solutions for the 2020 Electronic Population and Housing Census (e-census)” as a need to update and revise the current statistics, it will be deemed as necessary to further considering the relevant changes in the data collection and processing phases.
1.2 Consult and confirm needs	Identify stakeholders: Mongolia Sustainable Development Vision 2030 “Objective 5. Improve the legal environment for urban and land development based on the extant population settlements and residential systems.” indicates that there is a need for thematic survey report on population settlement based on census results. In this case, the stakeholders are organizations such as the National Development Agency, the Academy of Sciences, the National Development Institute, and the Ministry of Construction and Urban Development.

A need to be confirmed in detail: Ways to meet the needs – consider population localization and settlement issues in the thematic survey report on population settlement based on census results; Output – thematic research report on population settlement; Requirements for them - produce population settlement data in comparison with the results of the previous 3 censuses, and demonstrate detailed census results using the Geographic Information System.

When identifying common demands, consulting with users and validating, consider the Paragraph 1.112, "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations[7].

1.3 Establish output objectives

When determining the purpose of a census output, adhere to the Chapter 1: Essential features and census, and Section D, Chapter 2: Definitions and essential features, "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations[8], respectively.

Determined output	Output purpose	Output requirements
The 2020 Population and Housing Census: Integrated statistics	Present the justification, method and main results of the census	Comprehensively reflect the legal basis of the census, its regulation, census planning and promotion etc. organizational measures, summarize key demographic indicators such as population size, growth, nationality, ethnicity, density and settlement etc., as well as internal migration of the population, urbanization, households, marital status, economic activeness and housing conditions at the capital city, provincial and regional level, and compare with the previous census. Data includes the number and structure of people with disabilities, Internet and mobile phone users, and Mongolian citizens residing abroad.
The 2020 Population and Housing Census: Education and Literacy - Thematic survey 1	Determine the changes in the level of education and literacy of the population, which became one of the main indicators of human development, and identify the factors that influenced it.	Determine the changes in the level of education and literacy of the population and the influencing factors subject to the socio-economic changes in Mongolia over the past 30 years at the national, capital city and provincial levels. The report clearly indicates the evaluations and conclusions where the education level of the population is linked with the main indicators such as age, gender, ethnicity, economic activeness, school enrollment of school-aged children; and the changes and statuses of main indicators are linked with socio-economic factors.
Migration and Settlement - Thematic survey 2	Over the past 20 years, both internal and external migration, which have a strong impact on socio-economic development, have been intensified and there have been significant changes in population number and structure at the national, capital city, provincial and regional level. Hence, detailed evaluation needs to be done on migration at the national, capital city, provincial and regional level.	Perform a detailed survey on migration at the national, capital city, provincial and regional level, and report the current status of population settlement and its future trends etc. Internal and external migration of population in survey is classified by time since birth or every 5 years etc., and reflect intensified migration and all indicators including socio-economic factors affecting it.
and so on.		

1.4 Identify concepts and definitions:

Sources for the concepts and definitions used in the Population and Housing Census:

- Articles 10 and 11, the Law on Population and Housing Census;
- The concepts and definitions used in the previous or 2010 Population and Housing Census;

[7] "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations, 2014

[8] "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations, 2014

- The "Principles and Recommendations for Population and Housing Censuses: Revision 3"[9], adopted by the UN in 2014 and recommended to its member countries, 31 basic indicators for the population census and 19 basic indicators for the housing census were defined in the census questionnaire;
- "Conference of European Statisticians: Recommendations for the 2020 Censuses of Population and Housing", UNECE, New York and Geneva, 2015 etc.

List of concepts and definitions:

No.	Concept	Definition
HOUSEHOLD AND POPULATION		
1	Household	A household is a group of people who live together in the same accommodation, shares household expenses, food and other basic necessities together. A household member means spouses, relatives or related by blood, and some members can be unrelated at all.
2	Main household	Despite of the type of the housing unit, the"Main household" is the household who owns the housing unit based on a certificate to own, or a rental contract, or it is the household who has lived longest in the housing unit if the owner is someone else.
3	Sharing household	The sharing household is the household who is living together with the main household in one housing unit.
4	Household head	The household head will be determined by the members of the household. The household head is a family member, who usually reside in the household, is above 16 years old, the main contributor to the household income, plays a significant role in decision making of the household.
5	Household members	The household members are one person or a group of people who are relatives or family members who live together in one housing unit, with a joint budget, and jointly provide food and other basic needs. However, relatives and other people who are not members of the household can live in this household during the census date.
DISABILITY AND TYPE		
6	Disabled person	A disabled person is a person who has lost his/her ability to participate in social relations permanently or for more than 12 months due to physical, psychological, mental, or sensory difficulty.
7	Congenital disability	The limited ability to participate in social relationships due to a physical, psychological, mental, or sensory difficulty caused by a genetic disorder, or pregnancy and delivery complications.
	...	
RESIDENCE		
14	Usual resident	A person who has lived in the administrative unit for more than 6 months (183 days) as of the census date.
15	Temporarily absent	A person who has been temporarily absent from the administrative unit of usual residence for less than 6 months (183 days) as of the census date.
	...	
EDUCATION		
	...	
FAMILY STATUS		
	...	
EMPLOYMENT		
	...	
NATIONAL STANDARD CLASSIFICATION OF OCCUPATIONS AND ITS DEFINITIONS		
	...	
DEFINITIONS OF STANDARD INDUSTRIAL CLASIFICATIONS OF ALL ECONOMIC ACTIVITIES		
	...	
HOUSING		
	...	

1.5 Check data availability

Let's assume that the Ministry of Construction and Urban Development has made a request for clarification on detailed home ownership types of households. More specifically, for households living in a apartment, including an apartment owned by a citizen, they wanted to know how that apartment is bought: either 8 percent mortgage loan or a real estate loan offered by commercial banks. In this case, consider the sources that can provide this type of survey and data. The State Registration Database of Property Rights, Intellectual Property Office of Mongolia can be treated as a potential source. Therefore, a need for determining the status of household home ownership can be checked by comparing it with the existing database of the State Registration Database of Property Rights, Intellectual Property Office of Mongolia, in the following manner.

[9] "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations, 2014

Consistency criteria	For identified need	For existing data and survey (State registration database of property rights)	Discrepancy evaluation and conclusion	Actions to be taken to eliminate discrepancies
Scope	Includes all types of housing that the population and households live	Includes real estate. There is a possibility that "ger" or dwelling can be excluded, and non-residential building will not be included at all.	Coverage varies widely.	Add this type of data to the next census.
Concepts and Definitions	The house where the family lives	Land and property that cannot be used as intended once separated from it	Inconsistency between concepts and definitions:	
Period of time	At the current time	Determined by the registration period	There may be a time difference.	

1.6 Develop the concept of statistical business processes:

Based on the new needs identified in previous phases, clarify the items that need to be added and improved on the previous or 2010 Population and Housing Census business process model, and how they need to be changed in which phases and sub-procceses of the new or 2020 Population and Housing Census.

Phases and sub-processes of the GSBPM	As-Is Model	Areas of improvement and changes to be made
A	1	2
1. Identify needs		
2. Design	2.3 A data collection plan Data collection method: Paper questionnaires filled by face-to-face interview (PAPI)	Data collection method: Besides traditional methods, use a combination of methods such as Computer-assisted web interview (CAWI)
3. Build statistical business process model	3.1 Creation of data collection tools Develop a Population and Housing Census form for approval, and print it 3.4 Modeling a statistical business process Review & validate the processing status of forms and instructions of the Population and Housing Census. 3.5 Testing elements to be used in statistical processes Test the census form and data entry software. 3.6 Fully testing the statistical business process model Conduct pilot enumeration and complete survey questionnaire.	Prepare an e-survey for the Population and Housing Census based on approved census form, and prepare a website for data entry and validation. Check the functionality of a website for electronic questionnaire & data entry and checking. Test all tools and systems used in data collection through pilot enumeration and make necessary improvements.
4. Data collection		
5. Data processing		
6. Analysis		
7. Dissemination		
8. Evaluation		

2. Design

2.1 Design outputs

1. Prepare a list of outputs to be produced: When preparing a list of statistical products and services to be created as a result of the census, consider the product of the previous census and products to meet the newly identified needs etc. Moreover, it is necessary to consider the list of dissemination products mentioned in the section VIII. Census products and services, Part Three: Census Products and Data Utilization, "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations[10].

- Printed products: Integrated statistics reports, results tables (main tables and additional tables), thematic and in-depth survey reports, methodological reports and management reports (p219-227).
- Results based on geographic database: demographic atlas - basic and thematic cartographic data (p227-228).
- Web-based interactive online products: Web-based interactive online database, software and geographic database (p230), where user can obtain tables and charts of selected indicators, variables and classifications.
- Metadatabase (p231).
- Microdatabase available to users

[10] "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations, 2014

	- Products of general interest and reports for specific users: Posters, brochures, user-specific reports (policy summary reports, thematic and in-depth reports, key result reports, detailed tables and articles etc.), videos, instructions for using census results etc. **2. Definition of each output product:** Each proposed statistical product and service will be identified and planned in detail as follows. - Content: Content of tables and definitions, data entry period, indicators, and title & content of the thematic report etc. to be reflected in the printed products such as integrated statistics reports, thematic survey reports, and provincial & capital city census summary results etc. - Accuracy level of statistics: For the number of employed population aged 15 and above at the level of 2 decimals or sub-classifications of the economic activity sector, and at the level of the major group of occupational classifications; integrated statistics report at the provincial and capital city level; and provincial & capital city census summary results at the soum and district level etc. - Templates of tables and charts: Indicators to appear in table rows and columns, and types of charts etc. In particular, the main body of the census summary results consists of 85 tables of 10 groups, and the appendix contains 84 tables of 72 types etc. - Intended use of statistical products, services or outputs: For printed products, for data dissemination systems, for micro-data dissemination, for metadata repositories, and for quality reports etc. **3. Determine the systems needed to produce statistical products and services:** Determine the template files, software and website needed to produce statistical products and services based on census results. It includes: - Printed product files such as summary reports of previous censuses, thematic survey reports, and summary results of provincial and capital city censuses etc. These files will be used for preparing the census result report. - Software, standard software syntaxes, and table & chart designs used to create tables and charts reflected in result reports. - - Dissemination of geographic databases and microdata, and database structures & models for creating user-defined tables and charts etc.
2.2 Determine and design variables	**Determine variables:** This sub-process initially defines the statistical variables to be obtained by data collection and the statistical variables and units to be calculated and derived from them. This will result in the production of a list of variables, their types and definitions. In doing so, use the variables and their definitions specified in Part Two: Topics for population and housing census, "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations. **Determine standard statistical classifications to use:** By defining standard statistical classifications to be used for the identified indicator, a database of standard statistical classifications is created and links to further phases are established. The Population and Housing Census uses the National Classification for the Economic Activities, Version 4 *(ISIC Rev.4)* and the National Classification of Occupations *(UAMAT-08)*. Moreover, apply nominal variables or response options used in previous censuses or frequently used in statistical surveys and reports. In particular, the form of liability of enterprises and entities, and the type of property can be used.
2.3 A data collection plan	When planning census data collection, adhere to III. Planning, organization and administration of population and housing census, Part One: Operational aspects of population and housing census, "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations. **Determine the data collection method:** Trained enumerators visit census tracts one by one and complete enumeration forms by conducting face-to-face interviews. **Determine the tools that will be used to collect data:** This section defines the forms and instructions used in the Population and Housing Census. For instance: - Questionnaire of the ..... (year) Population and Housing Census of Mongolia (Form HAOST-1) - Online questionnaire on citizens of Mongolia residing abroad for 6 months and more (Form HAOST-1.2) - Questionnaire of the ..... (year) Quality Check of Population and Housing Census of Mongolia (Form HAOST-1) - Household and population registration for the ..... (year) Population and Housing Census of Mongolia (Form HAOST-3)

- Progress-1 of the ..... (year) Population and Housing Census of Mongolia (Form HAOST-4)
- Progress-2 of the ..... (year) Population and Housing Census of Mongolia (Form HAOST-5)
- Completed Survey Receipt of the..... (year) Population and Housing Census of Mongolia (Form HAOST-6)
- Preliminary Result-1 of the ..... (year) Population and Housing Census of Mongolia (Form HAOST-7)
- Preliminary Result-2 of the ..... (year) Population and Housing Census of Mongolia (Form HAOST-8)
- Preliminary Result-3 of the ..... (year) Population and Housing Census of Mongolia (Form HAOST-9)
- Expense Report-1 of the ..... (year) Population and Housing Census of Mongolia (Form HAOST-10)
- Expense Report-2 of the ..... (year) Population and Housing Census of Mongolia (Form HAOST-11)
- Instructions for Completing the Questionnaire of the ..... (year) Population and Housing Census of Mongolia
- Instructions for allowing preliminary participation of citizens in the census.

Moreover, determine the elements such as topographic map, content map, list of administrative division codes, symbolic emblems and promotional materials to be used in the census etc.

In addition, search for census data entry software, classifications, codes and standards; select a software for coding census questionnaires and statistical process control; and web-based software for online questionnaire.

Determine the legal basis for data collection and prepare necessary documents: The following legal documents in connection with organizing population and housing census will be considered and used as the legal basis of organizing the census. It includes:

Law on Population and Housing Census

- Paragraph 1, Article 7, the Law on Statistics.

The following legal documents in connection with organizing the census have been developed and approved. It includes:

Parliament resolution

- On the establishment of a state commission
- On scheduling the census

Decree by the State Commission on Population and Housing Census of Mongolia

- On establishing a census commission
- On Topographic map of the ..... (year) Population and Housing Census of Mongolia
- On intensification of activities
- On calculating census data processing
- Integrated result of the ..... (year) Population and Housing Census of Mongolia

Order by Chairman of the National Statistical Office

- On approving the master plan for the ..... (year) Population and Housing Census of Mongolia
- On approving the emblem prototype
- On establishing a technical working group
- On providing integrated management and coordination of the activities of central state administrative organizations, and provincial & capital city census commissions
- On approval of content and model of a map to be used in the Population and Housing Census of Mongolia.
- On approval of the concept for conducting a census quality check etc.

Plan other activities to support data collection:

In this section, the following activities will be planned to support census data collection. It includes:

- Develop a data collection plan: Develop action plan and master plan reflected 41 items for census preparation; and create a detailed chart with 226 activities scheduled in detail in the plan approved by the State Commission.
- Approve the composition of the state commission for organizing the census; form the census commissions, headed by corresponding level Governors, with a function to organize census in relevant ministries, all provinces and capital city; and establish of sub-commissions and temporary bureaus at corresponding levels of each administration unit.
- Recruiting and training data collectors: It includes training plans such as training for the employees of the Population and Housing Census Bureau; training for employees of all levels of census commissions and temporary bureaus; training of trainers; and training for enumerators and inspectors.

	- Prepare a list of units to be included in censuses, surveys and statistical reports: Develop an action plan for preparing maps to be used in the census, and population and household registers for the census. - Planning the data collection preparation: The tasks are planned within the scope of the data collection preparation. It includes: The budget and equipment needed for organizing the census are planned. - Outreach plan for the census. - Plan a system for capturing and reporting the scope of enumeration to be used during the census.
2.4 Sampling frame and sampling design	Not applicable.
2.5 Design processing & analysis	Adhere to Item 11 "Census result tables and database structures" and Item 15 "Data processing plan", III. Planning, organization and administration of population and housing census, Part One: Operational aspects of population and housing census, "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations. **1. Design data processing:** **1.1. Determine the software for data entry, integration, validation and editing.** Modern software suites such as CSPro and SPSS are used to process the data of the Population and Housing Census. Search for classifications, codes and standards; and develop & use a program using .NET for coding census questionnaires in a networked-environment, and reporting & monitoring the census progress. Develop online citizen registration program using Symphony Framework technology. **1.2. Determine the limits of variable values and the relationship between the variables:** **Determine the limits of variable values.** Determine the limits of values and the number of characters for each variable described in sub-process "2.2 Determine and design variables". For numeric variables, set lower and upper limits for values to be chosen. In particular, the maximum age of a person can be determined as 150 years. For text-type variables, the number of input characters is limited, and you can specify the characters that should or shouldn't be included in the input characters. In particular, the first 2 characters of a survey participant's registration number can be defined as letters, and the next 8 characters as numbers. **Determine the relationship between variables.** Determine the following relationships between the variables described in sub-process "2.2 Determine and design variables". - Logical relationship: Determine whether the numeric values of the variables are mutually greater or less, and the logical relationships between the values of the named variables. In particular, the variables such as population literacy, education level, mobile phone & Internet use etc., are only applicable to people aged 6 years and above. - Check the sum total or balance: A relation where the sum total of numeric variables is equal to the value of another variable. - Logical Sequence and Skipping Pattern: Depending on the value of a given variable, a skipping pattern without entering the value of the next question or variable etc. In particular, an employment related questions will not be asked from persons under the age of 15. The limits of variable values and the relationship between the variables will serve as the grounds for checking and editing the data at this phase. **1.3. Determine the checks to be performed on data entry:** Based on the variables described in sub-process "2.2 Determine and design variables", and their value limits and relationships, the checks to be conducted at the data entry phase will be determined. Defines an error message to be displayed when out-of-range value is entered (crazy code or value), the relationship between variables is lost, and previously entered units and instances are entered etc. In particular, "Variable a must be greater than the value of variable b, please check" etc. In the same case, indicate whether the value is allowed or not. If it is allowed, specify that the descriptive information will be reflected and documented. **1.4. Determine a data integration method:** In case of merging the database of citizens enumerated on the Internet and in the Form HAOST-1, indicate as "use registration number as the key indicator to check database duplication" etc. **1.5. Determine the database coding scheme:** Determine the coding scheme for open-ended responses in the database For text responses, it can be coded depending on the meaning or included words in the text, and in this case, the coding scheme shall be determined. This is achieved by searching for classifications, codes and standards and using software for coding census questionnaires in a networked-environment. **1.6. Determine the type and direction of checking the database:** After entering the data, determine a method on how to check for errors that cannot be detected at the data entry phase or were forced at this phase. The types of checking the database are as follows:

- Repeat the checks at the data entry phase.
- Determine whether there are missing values or null values.
- Identify discrepancies between databases such as household & population registration database, and civil registration database.
- Determine the outliers for each variable in the database.

Methods on documenting errors from the above type of checks or creating error protocols is described here.

1.7. Clarify errors in the database and determine how to fix the results of clarification: The following are instructions for identifying, clarifying and correcting errors for each type of error in the error protocol generated by database check. There can be several methods for clarifying errors:

- Compare and clarify against the data on the core questionnaire
- Clarify by comparing with databases of other periods etc.

Based on the results of the clarification, instructions for performing the correction will be described here too. In particular, how to edit using clarifications and data obtained from which source etc.

1.8. Determine the imputation (replacing) method: If there are incomplete or missing values in the census database and this type of error is caused by data collection, use the cold-deck method.

1.9. Determine the criteria for determining that a database is finalized. By clarifying the criteria for determining the readiness of the database for analysis after the completion of the necessary processing, it will be possible to conduct a full-fledged database check.

To find out if the database is finalized, complete the checklist with the questions below. It includes:

- All above sub-processes 1.1-1.8 have been completed.
- Rechecked the database, and described each undetected error or error reflected in the error protocol.
- There are no unfilled null values, if they are exist, there is a description of the acceptance of such type of issues etc.

2. Plan data analysis: Create a census summary report, consists of 85 tables of 10 groups in the main body, and 84 tables of 72 types in appendices, and determine their list, row and column parameters. Also, prepare a syntax for creating these tables.

2.6 Determine the statistical business process model

Required elements can be planned for each sub-process of phases 4-7 of statistical business process model of the Population and Housing Census.

Sub-process	Elements to be created
4. Data collection	
4.1 Create a frame and select sample	Not applicable
4.2 Prepare for data collection	System for monitoring and managing data collection process
4.3 Implement data collection	Data collection system
4.4 Finalize data collection	Data collection report template
5. Data processing	
5.1 Integrate data	Compare and integrate the structure of each database to be merged - a variable specifying the integration rules and merging keys Data integration software
5.2 Classify and code	Coding rules and methods for classifying open-ended response fields, and list of classification code Software and syntax to code open-ended response fields automatically
5.3 Review & validate	It defines the rules and methods for detecting errors in statistical parameters. Software and syntax for detecting parameter errors Rules and methods for fault detection in time series Software and syntax for fault detection in dynamic systems
5.4 Edit & impute	Rules and methods for clarifying and correcting errors Rules and methods for imputation (hot deck, cold deck and mean substitution) and regression imputation Software, syntax and batch for implementing the imputation operation
5.5 Derive new variables & units	List of variables to be newly developed Deriving new variables - rules and methods for creation (through arithmetic operation and regression equation) Deriving new variables - develop software, syntax and batch for creation List of units to be created Rules and methods for creating new units (statistical units, their definitions and intercorrelations) Deriving new variables - software, syntax and batch for creation
5.6 Impute sampling weights	Rules and methods for adjusting sampling weights and entering sampling weights in the database Software, syntax and batch for calculating the sampling weight, entering the sampling weight into the database
5.7 Calculate aggregates	Rules and methods for calculating aggregate indicators from databases (aggregate indicators for calculation, In particular, total indicators, total size of the target

	population, sampling error, confidence interval etc., and the methodology for calculating them) Software, syntax and batch to calculate aggregates from microdatabase, merge databases and create databases
5.8 Finalize data files	Criteria and rules for finalizing data files
6. Analysis	
6.1 Prepare output design	Output tables and variables entering their rows and columns, method for determining values Software and syntax for creating result table Rule and method for creating statistical charts (statistical charts, their types, variables and dimensions) Software and syntax for creating statistical charts Method for detecting and eliminating seasonal effects in the time series of results, and modifying the time series Software and syntax for detecting and eliminating seasonal effects and modifying the time series Rule and method for updating tables in the time series of results Software and syntax for updating tables in the time series of results
6.2 Review and validate the output	Rules and instructions for reviewing and checking the generated output (order and method of checking (check spelling, format, style, check with data from other sources by comparing, check the status of increase and decrease of the time series, check the logical relationship between indicators etc.), document their findings, and decide whether to include the results of the review and validation into the output)
6.3 Interpreting the output	General rules and instructions for interpreting outputs and results within them (interpretation of outputs in terms of methodology and technique, and interpretation of results in outputs)
6.4 Monitoring the protection of data confidentiality	Procedures and recommendations for ensuring data confidentiality
6.5 Finalizing the output	Sequences and rules for finalizing the output
7. Dissemination	
7.1. Update output systems	Software for loading data and information into the data dissemination system Prepare the data and structure to be loaded in compliance with the structure of the data dissemination system Prepare the metadata structure to be entered into the metadatabase
7.2. Creating statistical products and services	Prepare templates of tables, charts, descriptive texts and methodological notes for regular printed products such as statistical bulletins, presentations and yearbooks etc. Prepare a customized survey report template Prepare templates for interactive tables, charts and infographics Downloadable tables, data and microdata structures for inserting on dissemination systems
7.3. Dissemination schedule for statistical products and services	Prepare templates for advertising products to be disseminated using social media and email marketing
7.4. Promoting statistical products and services	Prepare templates for promoting dissemination of statistical products
7.5. Manage user support	Create channels for collecting user feedback and demands concerning dissemination products, and enter them into the system to communicate with users.
7.1. Update output systems	Software for loading data and information into the data dissemination system Prepare the data and structure to be loaded in compliance with the structure of the data dissemination system Prepare the metadata structure to be entered into the metadatabase

3. Build statistical business process model	
3.1 Creation of data collection tools	Development of census questionnaire and enumeration: On questionnaires and report forms used in previous censuses, modify the questionnaire and form by adding the indicators and variables planned to be included in this census. Moreover, develop instructions for completing the census forms and report forms. Develop topographic map & content map models for use in the census Prepare symbolic emblems and promotional materials to be used in the census. Other items used for data collection: Training materials, and population & household registrations etc. for data enumerators.
3.2 Build or enhance process components	A system for monitoring the progress of census data collection will be developed. Develop a data entry software subject to data entry software policy assignment (a software for census data entry, integration, validation and editing – CSPro, determination of the limits of variable values and the relationship between the variables; checks to be performed at the data entry stage; a data integration method; and a data coding scheme). Develop a data analysis software subject to data analysis policy assignment (result tables and their designs).

3.3 Build or enhance dissemination components	In this sub-process, the following items shall be prepared: Load data and data structures in compliance with data dissemination system structures such as Census Database[11] and Demographic Atlas[12] Specifications, structure and content of metadata to be included in Enumeration and Survey Catalogue or metadatabase[13] Templates of tables, charts, descriptive texts and methodological notes for integrated results and thematic survey Templates of interactive tables, charts and infographics Downloadable tables, data and microdata structures for inserting on dissemination systems Template for advertising products to be disseminated using social media and email marketing Census data promotion model Create channels for collecting user feedback and demands concerning dissemination products, and enter them into the system to communicate with users.
3.4 Modeling a statistical business process	Place revised and newly created elements, determined to be used in the previous phases 3.1-3.3, subject to the sequence of phases from data collection through to dissemination (as shown in sub-process 2.6 Determine the statistical business process model).
3.5 Testing elements to be used in statistical processes	Checks and improvements to be made: 1. Check if the data collection tool is complete. 2. Check whether entered relevant data for the collection of statistical and survey data into the monitoring system of data collection process. 3. Check the functionality of the software and systems for data entry and collection 4. Check the functionality of the software for database check and maintenance. 5. Check the functionality of the data processing software. 6. Check the functionality of the data analysis software. 7. Check the functionality of the software for loading data and information into the data dissemination system. 8. Check whether prepared the data and structure to be loaded in compliance with the structure of the data dissemination system, and whether the prepared structure conforms to the structure of the dissemination system. 9. Check whether prepared metadata structure to be entered into the metadatabase, and whether the processed structure conforms to the structure of the metadatabase. 10. Check whether prepared templates of tables, charts, descriptive texts and methodological notes for integrated results and thematic survey reports. 11. Check whether prepared templates for interactive tables, charts and infographics. 12. Check whether prepared downloadable tables, data and microdata structures for inserting on dissemination systems. 13. Check whether prepared templates for advertising products to be disseminated using social media and email marketing. 14. Check whether prepared templates for promoting dissemination products of enumeration data. 15. Check whether created channels for collecting user feedback and demands concerning dissemination products, and entered them into the system to communicate with users.
3.6 Fully testing the statistical business process model	Conduct census test and pilot censuses, and make relevant modifications based on their results.
3.7 Finalize the statistical business process model	Check and prepare the following: Revisions, corrections and changes identified in previous sub-process of testing a statistical business process model, and their performances. List of plans, tools, systems, software, related documents and their formations User guides, training materials, and schedules of trainings & meetings
4. Data collection	

[11] http://arcgis.nso.mn/census/
[12] http://web.nso.mn/population_atlas/
[13] http://web.nso.mn/nadamn/index.php/catalog/126

4.1 Create a frame and select sample	Not applicable
4.2 Prepare for data collection	Obtain preparatory work plan for data collection and data collection plan from census commissions and temporary bureaus at each level, and monitor their performance using a checklist. Conduct trainings for census staff, heads of census commissions, instructors, enumerators and inspectors, and other trainings. Deliver documents, questionnaires and instructions for data collection to temporary census bureaus. Conduct promotional activities.
4.3 Implement data collection	Trained enumerators will visit households according to census maps, and collect & record census data through face-to-face interview. Citizens residing abroad will be involved in the census through an online census. Adopt and implement organizational measures related to the census. Ensure quality control of the census.
4.4 Finalize data collection	Complete data collection on the last day of the census date, and report the progress of the census. Enumerate and prepare census questionnaires, and submit them to the NSO. A census activity report is prepared by each temporary census bureau and census commission: The number and list of households and population included in data collection, the number and list of excluded households and population, and the reasons for exclusion from data collection This phase performs manual coding and verification, and manually enters the coded census questionnaire. Conduct a census quality check and determine the actions to be taken as a result of the census. In particular, should the additional households and populations, enumerated after the census quality check, be added to the census database etc.
5. Data processing	
5.1 Integrate data	Data collected through paper questionnaires will be combined with databases collected via the Internet.
5.2 Classify and code	Classifying and coding should be done before they are manually entered or in sub-process 4.4 Finalize data collection. Recheck whether the manually entered database contains all classifications and codes, and complete it.
5.3 Review & validate	Run an automated check and generate a list of errors (protocol) by a software based on the methodology developed by the Population and Housing Census Bureau.
5.4 Edit & impute	According to a list of errors (protocol), check each error against the core questionnaire, household and population data, and other relevant databases. Each error in the database shall be corrected manually one by one. On the other hand, the software fixes common system errors. Complete blank or missing values by imputing values from other databases.
5.5 Derive new variables & units	Based on the population enumerated in the household or the relationship indicator between household members and a household head, create a household type variable in the household database. In particular, single person household, nuclear household, extended household, and composite household.
5.6 Impute sampling weights	Not applicable.
5.7 Calculate aggregates	The census database does not calculate and include any aggregates.
5.8 Finalize database	Check whether the Population and Housing Census database is fully merged, classified and coded, recheck for any database errors, and make the database ready for analysis.
6. Data analysis	
6.1 Prepare output design	The census summary report, consists of 85 tables of 10 groups in the main body, and 84 tables of 72 types in appendices, will be created using the syntax developed as designed in sub-process 2.5. Create time series by merging data from the current census result tables with previous census results tables. Create tables and charts to be included in census results and thematic survey reports.

6.2 Review and validate the output	The census results will be checked as follows. Recognize the differences between the census and other sources: Evaluate the census results by comparing it against the surveys and data such as social indicator sample survey and civil registration data etc. Determine census coverage errors: Based on the results of the census quality check, decide whether there is a need to modify the census data, and interpret the results of the census coverage. Moreover, identify and evaluate errors related to the application of the coverage principle. Detect errors in the content: Assess and make conclusion on how well the responses match between the responses given in the official census and the census quality check. The age index will be calculated using the Whipple's index and Myers' index methods, and determine and make conclusion on whether age heaping is occurred.
6.3 Interpreting the output	Prepare descriptive text for reports based on the content and descriptive text of previous census or a summary report of the 2010 Population and Housing Census and the thematic survey report etc. The descriptive text of the result tables is based on a descriptive analysis method, and result values are calculated and compared between space (region, province, capital city, soum and district etc.) and time (between censuses).
6.4 Implementing data privacy controls	In accordance with the Clause 22.1, Article 22, the Law on Statistics, personal data will be kept confidential and will only be used to calculate aggregated results and statistical indicators, and it will also be checked whether data is specifically referred to a specific household or individual. In addition, check whether the conditions for identifying the given unit have arisen due to the level of accuracy, and take necessary measures. In particular, if there is 1 person over 100 years old in a given soum as per the table created by administrative unit, age and sex, a result table will be produced by combining it with other age groups. For the primary data of census, in accordance with the "Procedures for allowing users to use primary data of census and sample survey", the identification indicators such as household address, surname & name of household head, surnames, names and registration numbers of population have been removed from the primary data of census. Moreover, if a household or person can be identified directly due to the level of accuracy, the data confidentiality will be maintained by removing or changing the given unit.
6.5 Finalizing the output	As specified in the sub-process "Finalizing the output", check whether the actions such as review & validate the output, edit & impute, and ensuring data confidentiality etc. have been completed, and make dissemination products ready for production. Based on the results of ensuring data confidentiality and review & validate the output, determine the level of data release, and apply caveats. For example, the number of persons with disabilities by soum, district, age and gender etc. will not be included. Prepare descriptions, technical notes and briefings to be reflected in census summary reports and thematic survey reports, and make them ready for inclusion in these reports.
7. Dissemination	
7.1 Update output systems	Based on the results of the Population and Housing Census, prepare relevant data and databases for loading into the following dissemination systems: - Integrated Statistical Database[14] - enumeration result tables. - Enumeration and Survey Catalogue[15] - census metadata, census questionnaires, forms, microdatabase (households and persons), summary reports and thematic survey reports - Census Database[16], National Demographic Atlas[17] - Census microdatabase based on Geographic Information System.
7.2 Creating statistical products and services	Prepare the printed dissemination products or census summary reports and thematic survey reports in accordance with the proposed content, template format and requirements. Moreover, develop promotional materials for the census results such as brochures, posters and summary report presentations with infographics of the main outcome. Produced draft report and promotional materials of census summary report will be reviewed at the appropriate phases, and corrected if necessary, and make them ready for data dissemination.

[14] www.1212.mn
[15] http://web.nso.mn/nadamn/index.php/catalog/central/about
[16] http://arcgis.nso.mn/census/
[17] http://web.nso.mn/population_atlas/

	Non-printed dissemination products or downloadable statistical tables, data and microdatabases will be loaded to the above database.
7.3 Manage release of dissemination products and services	According to the action plan of the Population and Housing Census and the master plan for the dissemination of statistics, determine the date & time of the press release of the census summary results. The census summary results will be communicated to the public via press releases, presentation workshops and data dissemination through the media etc. In addition to the census summary results, a schedule for the data dissemination such as thematic survey reports, provincial and capital city census reports will be announced during this activity. It also defines the release date and plan of the dissemination product, press release of the dissemination product, procedure for communicating with users, dissemination channels and data content etc.
7.4 Promote statistical products and services	Define guidelines for promoting dissemination products of Population and Housing Census, promotional materials for dissemination products, content, templates, promotional activities and channels etc., and carry out activities for promoting statistical products and services, accordingly.
7.5 Manage user support	The Population and Housing Census Bureau will develop and implement guidelines for collecting and responding to user feedback and demands concerning dissemination products of the Population and Housing Census. When promoting and disseminating the results of proposed census, record & document user feedback and demands, and take & implement necessary actions. This documentation is an important data source that should be considered during the evaluation phase and when planning the next census. Guidelines for collecting and responding to user feedback and demands will set the boundaries for collecting and responding to user feedback and demands. This sub-process also develops and disseminates a data quality report for the users of the Population and Housing Census.
8. Evaluate	
8.1 Gather evaluation inputs	Once dissemination activities of the Population and Housing Census are fully implemented, the sub-process "Evaluate" will begin. The input for evaluation is the quality indicator data recorded in each sub-process, and the following data will be mainly considered: - Activity report for the phases from "Design" through to "Disseminate" - Results and conclusions of census quality check (whether scope and content errors are detected) - The results and conclusions on errors and problems detected during the "review & validate" activities carried out in the sub-process "Design processing and analysis", - Feedback and demands collected during the sub-process "Manage user support", their consideration and implementation of the necessary measures.
8.2 Conduct evaluation	The regular population and housing census will be evaluated as follows: - Evaluation and conclusion on the activities planned during the "Design" phase, compared with the implementation of the phases from data collection through to dissemination. - Implementation status of guidelines and recommendations of the "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations[18]. - Whether scope and content errors are detected, and their reasons - The results and conclusions on errors and problems detected during the "review & validate" activities carried out in the sub-process "Design processing and analysis", and their reasons Evaluation is carried out by comparing target indicators with performance indicators, and giving an evaluation.
8.3 Agree an action plan	Based on the evaluation result, develop an action plan to improve the Population and Housing Census for the next year by specifying corresponding phases, sub-processes, responsible departments, employees and timings etc. The Population and Housing Census Bureau will develop an action plan to improve the Population and Housing Census for the next year for discussion and approval by the Methodological Standing Committee and the Chairperson's council meeting. Evaluation of the current Population and Housing Census will take place 4 years after the census and one year before the mid-term census (for example, evaluation of the 2010 Population and Housing Census will be carried out in 2014).

[18] "Principles and Recommendations for Population and Housing Censuses: Revision 3", United Nations, 2014

Appendix 2: Statistical business process model for the CPI

<table>
<tr><th>Phases and sub-processes</th><th>As-Is Model and To-Be Model</th></tr>
<tr><td colspan="2">1. Identify needs</td></tr>
<tr><td>1.1 Identify needs</td><td>Determine source for identifying needs, and identify needs from them:
- Feedback and demands gathered from users via the data dissemination channels and SME in charge of data dissemination and customer relations: Obtain the consumer price index by a given product group, and get a detailed data concerning the price of consumer goods and services selected in the market basket etc.
- Needs arising from changes in the policy, program, organization, structure, and budget of the statistical sector: The National Strategy for Development of Statistics for 2017-2020: 2.3.3.11. conducting survey on consumer price index, 2.6.2.24. updating the methodology for calculating the consumer price index etc. Order by Chairman of the National Statistical Office - Methodology for calculating the consumer price index
- Needs arising from changes in the scope of legislations and development policies: Mongolia Sustainable Development Vision 2030 (Parliament Resolution No. 19 of 2016): keeping inflation low and stable etc. The Monetary Policy of Mongolia for ..... (year) (Parliament Resolution) etc.
- Demands arising from changes in international methods and recommendations: “Consumer price index manual: Theory and practice”, International Labor Office, International Monetary Fund, Organization for Economic Co-operation and Development, Statistical Office of the European Communities, United Nations, The World Bank, 2004 etc. documents.
- Provide updates and justifications

Categorize and analyze needs, and decide whether to consider the need further: The methodology for calculating the consumer price index was revised and approved in 2016, thus, it is considered that there is a need to improve the current statistics, and it is deemed necessary to make relevant changes in the data collection and processing phases.</td></tr>
<tr><td>1.2 Consult and confirm needs</td><td>Identify stakeholders: In the event that changes are made to the methodology for calculating the consumer price index in accordance with the recommendations of the Consumer Price Index Manual, consult with the following key users and confirm the needs in detail.

- Main users: Institutions such as the NSO’s SME in charge of the System of National Accounts and GDP Calculation, the Bank of Mongolia, the Ministry of Finance and Trade Union etc.
- Other users: Policy makers - the Parliament, the Ministry of Labor and Social Protection, and Civil Society Organizations - Mongolian Employers' Federation and Trade Union etc. Other users: Enterprises, organizations, research institutions and researchers etc.

A need to be confirmed in detail: If there is a need to reflect soum CPI in the calculation of the national CPI, needs are discussed in more detail such as developing justification & purpose of collecting CPI by soum, ways to meet such need or expansion of the CPI coverage, creating data coverage and market basket, developing instructions on price collection, and starting data collection etc.

In addition to identifying the need for changes and improvements in the CPI each time, regular consultations should be made with the main users at a specified frequency such as once a year etc.</td></tr>
<tr><td>1.3 Establish output objectives</td><td>The following output will be produced for the CPI.

<table>
<tr><th>Determined output</th><th>Output purpose</th><th>Output requirements</th></tr>
<tr><td colspan="3">In statistical bulletin</td></tr>
<tr><td>Brief summary (text)</td><td>Provide brief summary about the CPI and inflation rate.</td><td>Present the national year-end CPI performance changes from the previous year; and the average annual inflation rate and changes from the previous year.</td></tr>
<tr><td>List of tables (text)</td><td>Provide data such as the list of tables, the indicators they contain and the base period etc.</td><td>Provide data such as the list of tables, the indicators they contain and the base period etc.</td></tr>
</table>
</td></tr>
</table>

Description of the methodology (text)	Describe the CPI methodology.	Provide information on CPI definitions, usage, component descriptions, formulas used and reference periods.
National CPI, 2015 100, by group of goods and services (table)	Display dynamic national CPI and price changes	The row displays the period for the previous 4 years by month, and the column displays, by group of goods and services, and overall performance index, by percentage.
Change in the national CPI by compared to the end of the previous year, and by group of goods and services (table)	Display dynamic changes in national CPI and price changes	The row displays the period for the previous 4 years by month, and the column displays, by group of goods and services, and changes in overall performance, by percentage.
National CPI, monthly changes, by group of goods and services (table)	Display dynamic monthly changes in national CPI and price changes	The row displays the period for the previous 4 years by month, and the column displays, by group of goods and services, and changes in overall performance, by percentage.
Consumer price index, 1991-1-16=100 (table)	Display dynamic national CPI and price changes	Display dynamic CPI compared to the base period when it was initially calculated, i.e. January 16, 1991.
and so on.		
Average annual price of some consumer goods and services in Ulaanbaatar	Display average annual price changes of the main types of consumer goods and services in Ulaanbaatar.	Select the main types of consumer goods and services, and display the average annual price in MNT for the selected year. Enter name, unit of measurement and brief description of the goods and services.
and so on.		

1.4 Identify concepts and definitions:

Sources for defining concepts and definitions used in consumer price index:

- Methodology for calculating the Consumer Price Index, Order #... by the Chairman, NSO of 2016;
- "Consumer Price Index Manual: Theory and Practice", International Labor Office, 2004[19] etc.

List of concepts and definitions:

No.	Concept	Definition
1	Market basket	A list of consumer goods and services that may represent the consumption of a typical household compiled for the purpose of calculating consumer price index
2	Weight of consumer goods and services	Share of the cost of goods and services in the total cost of goods and services purchased by a household
3	Base period of consumer goods and services	The time when the index value is selected as equal to 100
	and so on.	

1.5 Check data availability

The availability of data, where the CPI can be obtained directly, can be used as a data source, is compared with the sources of other organizations, that collect and publish pricing data. In doing so, check whether the data currently available is consistent with the description of the goods and services selected in the market basket, description of the pricing data collection points, data collection period and price definition (purchase price or price inclusive of VAT and other taxes) etc. Pricing data for single or group of goods and services that meet all of the above parameters can be obtained from available data sources.

1.6 Develop the concept of statistical business processes:

The concept of "Calculation of the consumer price index"[20] will be revised and implemented as new types of demand arise each time.

Based on the new needs identified in previous phases, clarify the items that need to be added and improved on the previous or business process model for the CPI, and how they need to be changed in which phases and sub-processes of the new or next iteration.

Phases and sub-processes of the GSBPM	As-Is Model	Areas of improvement and changes to be made
A	1	2
1. Identify needs		
2. Design	2.3 A data collection plan Data collection method: Complete paper questionnaires by observations Make a call to obtain pricing data and complete a paper questionnaire 2.4 Sampling frame and sampling design	2.3 A data collection plan Data collection method: Use a combination of methods - Download data directly from data sources and databases available for pricing data (VAT incentive system, POS machine and e-commerce websites etc.).

[19] "Consumer price index manual: Theory and practice", International Labor Office, International Monetary Fund, Organization for Economic Co-operation and Development, Statistical Office of the European Communities, United Nations, The World Bank, 2004

[20] The concept of "Calculation of the consumer price index", Order No. 1/17 by the Chairman of the NSO, of 2006

		Choose directly, considering whether there is a large number of consumers, whether there is a large selection of goods and whether activities are carried out regularly etc.	- Complete paper questionnaires by observations - Contact the call center to get pricing data and put it directly into the database. 2.4 Sampling frame and sampling design: Define criteria for target sampling to select rural soums for inclusion in the pricing data. Create a database or a sampling frame for 6 main districts of the capital city, soum centers of each provincial capital, and rural grocery stores in sampled target soums. Define the selection criteria for grocery stores to collect pricing data from the sampling frame.
	3. Build statistical business process model	3.1 Creation of data collection tools Pricing data form, Price collection guide, Illustrated catalogue for basket of goods and services, and File for pricing data submission 3.2 Build or enhance process components Put pricing data in MS-Excel file and calculate CPI.	3.1 Creation of data collection tools Pricing data form, Price collection guide, and Illustrated catalogue for basket of goods and services Systems and software for retrieving pricing data from other sources Software for pricing data entry, checking, editing and processing 3.2 Build or enhance process components Create a software for pricing data entry, checking, editing, imputing; and calculating variables, units and aggregate indices and entering them into the database; and calculating the CPI.
	4. Data collection		
	5. Data processing		
	6. Analysis		
	7. Dissemination		
	8. Evaluation		
2. Design			
2.1 Design outputs	The following principles will be observed when disseminating the CPI as set forth in the Paragraph 13.2, Chapter 13. Publication, dissemination and user relations, "Consumer Price Index Manual: Theory and Practice", International Labor Office, 2004[21]. It includes: - Released as soon as possible; - Made available to all users at the same time; - Released according to pre-announced timetables; - Released separately from ministerial comment; - Made available in convenient form for users; - Accompanied by methodological explanation; - Backed up by professional statisticians and economists who can answer questions and provide further information. **1. Prepare a list and definition of outputs to be produced:** When preparing a list of statistical products and services of the CPI, consider products and services that have been produced previously, as well as products and services that meet newly identified demands. Moreover, pay attention to a list and description of the dissemination products specified in the Chapter 13. Publication, dissemination and user relations, "Consumer Price Index Manual: Theory and Practice", International Labor Office, 2004[22]. - Printed products: Statistical bulletins, presentations, yearbooks (p13.38-13.41), their methodological notes, descriptive texts, tables, charts, content, model template formats and levels of accuracy. - Web-based interactive online products and microdatabase available to users: Web-based interactive online database and software, where user can obtain tables and charts of selected indicators, variables and classifications (p13.55-13.56). - Metadatabase (p13.57). - Promotional materials: Posters, brochures, infographics and instructions for using the CPI etc.		

[21] "Consumer price index manual: Theory and practice", International Labor Office, International Monetary Fund, Organization for Economic Co-operation and Development, Statistical Office of the European Communities, United Nations, The World Bank, 2004

[22] "Consumer price index manual: Theory and practice", International Labor Office, International Monetary Fund, Organization for Economic Co-operation and Development, Statistical Office of the European Communities, United Nations, The World Bank, 2004

	2. Determine the systems needed to produce statistical products and services: Determine the template files, software and website needed to produce statistical products and services based on census results. It includes: - Files for the data dissemination printed products. These files will be used for preparing printed products for dissemination in a given iteration. - Software, template files, tables and chart templates for use in creating tables and charts. - Web-based interactive online products and microdatabase available to users etc.
2.2 Determine and design variables	**Determine variables:** This sub-process initially defines the statistical variables to be obtained by data collection and the statistical variables and units to be calculated and derived from them. This will result in the production of a list of variables, their types and definitions. It defines variables to be entered into the database such as prices, definitions and descriptions of products & services. **Determine standard statistical classifications to use:** By defining standard statistical classifications to be used for the identified indicators, a database of standard statistical classifications is created and links to further phases are established. When determining the classifications for use in the CPI, adhere to the Paragraphs 3.144-3.168, 3. Concepts and scope, "Consumer Price Index Manual: Theory and Practice", International Labor Office, 2004[23]. Apply the Classification of individual consumption by purpose (COICOP) to calculate the consumer price index. Also, you can use grocery store classifications, pricing data collection results, and descriptive classifications and codes etc.
2.3 A data collection plan	When planning the census data collection, adhere to the Chapter 6. Price collection, "Consumer Price Index Manual: Theory and Practice", International Labor Office, 2004[24]. **Determine the data collection method:** Use a combination of methods to collect pricing data. - Download data directly from data sources and databases available for pricing data (VAT incentive system, POS machine and e-commerce websites etc.). - Complete paper questionnaires by observations - Contact the call center to get pricing data and put it directly into the database. **Determine the tools that will be used to collect data:** - Pricing data form, - Price collection guide, - Illustrated catalogue for basket of goods and services, - Systems and software for retrieving pricing data from other sources - Software for pricing data entry, checking, editing and processing. **Plan other activities to support data collection:** - Prepare letters addressed to corner stores and grocery stores to collect pricing data, and draft contracts on providing pricing data, participating in data collection and ensuring working conditions for pricing data collection staff. - Recruiting and training data collectors: Recruit a pricing data collection team and develop training plans for them. - Prepare a list, addresses and photos of corner stores and grocery stores to gather pricing data. - Planning the data collection preparation: The tasks are planned within the scope of the data collection preparation. It includes: The budget and equipment needed for pricing data collection are planned.
2.4 Sampling frame and sampling design	When planning the sampling frame and sampling design, adhere to the Chapter 5. Sampling, "Consumer Price Index Manual: Theory and Practice", International Labor Office, 2004[25]; and the Item 4.1 "Selection of pricing data collection points, setting deadlines and collecting prices", Order

[23] "Consumer price index manual: Theory and practice", International Labor Office, International Monetary Fund, Organization for Economic Co-operation and Development, Statistical Office of the European Communities, United Nations, The World Bank, 2004

[24] "Consumer price index manual: Theory and practice", International Labor Office, International Monetary Fund, Organization for Economic Co-operation and Development, Statistical Office of the European Communities, United Nations, The World Bank, 2004

[25] "Consumer price index manual: Theory and practice", International Labor Office, International Monetary Fund, Organization for Economic Co-operation and Development, Statistical Office of the European Communities, United Nations, The World Bank, 2004

	#... on “Methodology for calculating the Consumer Price Index” by the Chairman, NSO of 2016. Where: 1. Determine the types of goods and services to be included in the market basket: Not all classifications of Household socio-economic surveys may be included in the market basket, thus, select the items that can represent the prices of widely used similar goods and services, considered as important for use. However, choose goods and services that account for at least 0.2% or more of total household consumption expenditure. Choosing a range of goods and services shall be based on the following principles: It includes goods and services that are widely used by the population and have high circulation; available to register the prices as per the specifications; likely to be sold in the market for a certain period of time; and it is necessary to present the household consumption. 2. Time and period for collecting prices and tariffs: Pricing surveys will be carried out regularly between 22-28th of each month in the capital city; 18-20th of each month in provincial capitals; and 15-17th of each month in soums. In the capital city, pricing survey of staple food products, which have high price fluctuations, are conducted every 7 days. 3. Select price collection points: When selecting price collection points, choose by target non-probability sampling, considering whether there is a large number of consumers, whether there is a large selection of goods and whether activities are carried out regularly etc. Meanwhile, the representation of smaller points will also be considered. Grocery stores, markets and corner stores to be surveyed need to represent their district or province; and for single commodity, collect at least 5-6 prices in the captal city, 3-4 prices in provincial centers, and up to 3 prices in soums.
2.5 Design processing & analysis	Adhere to the chapters 6-11, “Consumer Price Index Manual: Theory and Practice”, International Labor Office, 2004; and the items 2.3.2-2.3.3 and chapters 5-8, “Selection of pricing data collection points, setting deadlines and collecting prices”, Order #... on “Methodology for calculating the Consumer Price Index” by the Chairman, NSO of 2016. **1. Design data processing:** **1.1. Determine the software for data entry, integration, validation and editing.** Special software should be developed for entering, integrating, checking and editing the CPI. **1.2. Determine the limits of variable values and the relationship between the variables:** **Determine the limits of variable values.** Set minimum and maximum value limits (min and max) for goods and services. **1.3. Determine the checks to be performed on data entry:** Plan the following checks to be performed when entering pricing data. It includes: - Whether the price value increased or decreased by 25% or more compared to the price of the previous month (+/-25%) - Whether the goods and services are within the minimum and maximum price limits (min<x<max) - Determine whether the price of other items is lower or higher by a certain percentage than the average price of the capital city, provinces or soums. **1.4. Determine the database coding scheme:** The variables in the database are pre-coded. **1.5. Determine the type and direction of checking the database:** After entering the data, determine a method on how to check for errors that cannot be detected at the data entry phase or were forced at this phase. The types of checking the database are as follows: - Repeat the checks at the data entry phase. - Check at the provincial and regional level. - Determine whether there are missing values or null values. - Determine the outliers for each classification of goods and services in the database. Methods on documenting errors from the above type of checks or creating error protocols is described here. **1.6. Clarify errors in the database and determine how to fix the results of clarification:** The following are instructions for identifying, clarifying and correcting errors for each type of error in the error protocol generated by database check. There can be several methods for clarifying errors: - Consider the descriptions and clarifications on pricing data in the pricing database - Contact the SME who collected pricing data for clarification - Clarify by comparing with databases of other periods etc. Based on the results of the clarification, instructions for performing the correction will be described here too. In particular, how to edit using clarifications and data obtained from which source etc. **1.7. Determine the imputation (replacing) method:** When making price substitutions, calculate the average of the prices collected in the reporting month and the base period, determine their

changes, and multiply the prices of the previous month by the average price changes. Also, the price substitution is done explicitly. Index substitution is done implicitly.

1.8. Determine the criteria for determining that a database is finalized. By clarifying the criteria for determining the readiness of the database for analysis after the completion of the necessary processing, it will be possible to conduct a full-fledged database check.

To find out if the database is finalized, complete the checklist with the questions below. It includes:

- All above sub-processes 1.1-1.7 have been completed.
- Rechecked the database, and described each undetected error or error reflected in the error protocol.
- There are no unfilled null values, if they are exist, there is a description of the acceptance of such type of issues etc.

2. Plan data analysis: Determine the order, methodology, formula and software for linking the new time series to the base period, linking the old time series to the base period, calculating the consumption weight, calculating the individual index of goods and services, and calculating the subgroup index and the group index, and calculating the overall CPI.

2.6 Determine the statistical business process model

Required elements can be planned for each sub-process of phases 4-7 of statistical business process model of the CPI.

Sub-process	Elements to be created
4. Data collection	
4.1 Create a frame and select sample	List of grocery stores or sampling frame Criteria for selecting grocery stores and sampling models etc.
4.2 Prepare for data collection	- Conduct prior check and confirm the description of the goods and services included in the pricing data and grocery stores. - Price collection guide and illustrated catalogue for basket of goods and services - Systems and software for retrieving pricing data from other sources; install software for pricing data entry, checking, editing and processing and check the functionality etc.
4.3 Implement data collection	Data collection system
4.4 Finalize data collection	Data collection report template
5. Data processing	
5.1 Integrate data	Compare and integrate the structure of each database to be merged - a variable specifying the integration rules and merging keys Data integration software
5.2 Classify and code	Coding rules and methods for classifying open-ended response fields, and list of classification code Software and syntax to code open-ended response fields automatically
5.3 Review & validate	It defines the rules and methods for detecting errors in statistical parameters. Software and syntax for detecting parameter errors Rules and methods for fault detection in time series Software and syntax for fault detection in dynamic systems
5.4 Edit & impute	Rules and methods for clarifying and correcting errors Rules and methods for imputation (hot deck, cold deck and mean substitution) and regression imputation Software, syntax and batch for implementing the imputation operation
5.5 Derive new variables & units	List of variables to be newly developed Deriving new variables - rules and methods for creation (through arithmetic operation and regression equation) Deriving new variables - develop software, syntax and batch for creation List of units to be created Rules and methods for creating new units (statistical units, their definitions and intercorrelations) Deriving new variables - software, syntax and batch for creation
5.6 Impute sampling weights	Rules and methods for adjusting sampling weights and entering sampling weights in the database Software, syntax and batch for calculating the sampling weight, entering the sampling weight into the database
5.7 Calculate aggregates	Rules and methods for calculating aggregate indicators from databases (aggregate indicators for calculation, In particular, total indicators, total size of the target population, sampling error, confidence interval etc., and the methodology for calculating them) Software, syntax and batch to calculate aggregates from microdatabase, merge databases and create databases
5.8 Finalize data files	Criteria and rules for finalizing data files
6. Analysis	
6.1 Prepare output design	Output tables and variables entering their rows and columns, method for determining values Software and syntax for creating result table

		Rule and method for creating statistical charts (statistical charts, their types, variables and dimensions) Software and syntax for creating statistical charts Method for detecting and eliminating seasonal effects in the time series of results, and modifying the time series Software and syntax for detecting and eliminating seasonal effects and modifying the time series Rule and method for updating tables in the time series of results Software and syntax for updating tables in the time series of results
	6.2 Review and validate the output	Rules and instructions for reviewing and checking the generated output (order and method of checking (check spelling, format, style, check with data from other sources by comparing, check the status of increase and decrease of the time series, check the logical relationship between indicators etc.), document their findings, and decide whether to include the results of the review and validation into the output)
	6.3 Interpreting the output	General rules and instructions for interpreting outputs and results within them (interpretation of outputs in terms of methodology and technique, and interpretation of results in outputs)
	6.4 Monitoring the protection of data confidentiality	Procedures and recommendations for ensuring data confidentiality
	6.5 Finalizing the output	Sequences and rules for finalizing the output
	7. Dissemination	
	7.1. Update output systems	Software for loading data and information into the data dissemination system Prepare the data and structure to be loaded in compliance with the structure of the data dissemination system Prepare the metadata structure to be entered into the metadatabase
	7.2. Creating statistical products and services	Prepare templates of tables, charts, descriptive texts and methodological notes for regular printed products such as statistical bulletins, presentations and yearbooks etc. Prepare a customized survey report template Prepare templates for interactive tables, charts and infographics Downloadable tables, data and microdata structures for inserting on dissemination systems
	7.3. Dissemination schedule for statistical products and services	Prepare templates for advertising products to be disseminated using social media and email marketing
	7.4. Promoting statistical products and services	Prepare templates for promoting dissemination of statistical products
	7.5. Manage user support	Create channels for collecting user feedback and demands concerning dissemination products, and enter them into the system to communicate with users.
	7.1. Update output systems	Software for loading data and information into the data dissemination system Prepare the data and structure to be loaded in compliance with the structure of the data dissemination system Prepare the metadata structure to be entered into the metadatabase
3. Build statistical business process model		
3.1 Creation of data collection tools	The following elements will be used to collect pricing data: - Pricing data form - Conduct prior check and confirm the description of the goods and services included in the pricing data and grocery stores. - Create a dataset of price collection points - Price collection guide and illustrated catalogue for basket of goods and services - Systems and software for retrieving pricing data from other sources; and software for pricing data entry, checking, editing and processing.	
3.2 Build or enhance process components	Develop a data entry software subject to data entry software policy assignment (software for pricing census data entry, integration, validation and editing). Develop a data analysis software subject to data analysis policy assignment (result tables and their designs).	

3.3 Build or enhance dissemination components	In this sub-process, the following items shall be prepared: - Printed products: Statistical bulletins, presentations, yearbooks and their methodological notes, descriptive texts, tables, charts, content, model template formats and levels of accuracy. - Web-based interactive online products and microdatabase available to users: Web-based interactive online database and software, where user can obtain tables and charts of selected indicators, variables and classifications. - Metadatabase. - Promotional materials: Posters, brochures, infographics and instructions for using the CPI etc. - Downloadable tables, data and microdata structures for inserting on dissemination systems - Template for advertising products to be disseminated using social media and email marketing - Create channels for collecting user feedback and demands concerning consumer price statistics, and enter them into the system to communicate with users.
3.4 Modeling a statistical business process	Place revised and newly created elements, determined to be used in the previous phases 3.1-3.3, subject to the sequence of phases from data collection through to dissemination (as shown in sub-process 2.6 Determine the statistical business process model).
3.5 Testing elements to be used in statistical processes	Checks and improvements to be made: 1. Check if the data collection tool is complete. 2. Check whether entered relevant data for the collection of statistical and survey data into the monitoring system of data collection process. 3. Check the functionality of the software and systems for data entry and collection 4. Check the functionality of the software for database check and maintenance. 5. Check the functionality of the data processing software. 6. Check the functionality of the data analysis software. 7. Check the functionality of the software for loading data and information into the data dissemination system. 8. Check whether prepared data and structure to be loaded in compliance with the structure of the data dissemination system, and whether the prepared structure conforms to the structure of the dissemination system. 9. Check whether prepared metadata structure to be entered into the metadatabase, and whether the processed structure conforms to the structure of the metadatabase. 10. Check whether prepared templates of tables, charts, descriptive texts and methodological notes to be reflected in statistical bulletins, presentations and yearbooks. 11. Check whether prepared templates for interactive tables, charts and infographics. 12. Check whether prepared downloadable tables, data and microdata structures for inserting on dissemination systems. 13. Check whether prepared templates for advertising products to be disseminated using social media and email marketing. 14. Check whether prepared templates for promoting dissemination products of enumeration data. 15. Check whether created channels for collecting user feedback and demands concerning dissemination products, and entered them into the system to communicate with users.
3.6 Fully testing the statistical business process model	Collect, process and analyze test data and make appropriate modifications based on their results.
3.7 Finalize the statistical business process model	Check and prepare the following: Revisions, corrections and changes identified in previous sub-process of testing a statistical business process model, and their performances. List of plans, tools, systems, software, related documents and their formations User guides, training materials, and schedules of trainings & meetings
4. Data collection	
4.1 Create a frame and select sample	Prepare a list of grocery stores to gather pricing data, and conduct the sampling as per the defined methodology and model. Then, ascertain whether it is possible to collect pricing data as per the descriptions of selected goods and services at the grocery stores, and take measures on substituting or replacing the grocery stores.

4.2 Prepare for data collection	The price data collection staff shall determine the address and location of the selected grocery stores, and review and familiarize with price data collection manual & illustrated catalogue. Contact corner stores and grocery stores in advance, send official letter regarding the collection of pricing data, and make a contract, if necessary. Install the pricing data entry software on the data collection tablet and check its functionality for ensuring readiness.
4.3 Implement data collection	The price data collection staff shall visit the corner stores and grocery stores at regular intervals, record pricing data and enter it into the database. For certain types of goods and services, the pricing data is clarified by phone and entered into the database. Moreover, for certain types of goods and services, pricing data will be downloaded directly from the relevant source and integrated directly into the database.
4.4 Finalize data collection	On the last day of the pricing data collection period, data collection will be ceased and the ability to enter and modify data in the database will be stopped in a unified manner.
5. Data processing	
5.1 Integrate data	Data will be collected using same software and entered into a single database, so there will be no data integration.
5.2 Classify and code	Since the same pre-coded database and data entry software will be used, "classify and code" actions will not be performed.
5.3 Review & validate	According to a predetermined methodology and software, the following checks are performed in the database and generate a list of errors (protocol): - Repeat the checks at the data entry phase: Whether the price value increased or decreased by 25% or more compared to the price of the previous month (+/-25%) - Whether the goods and services are within the minimum and maximum price limits (min<x<max) - Determine whether the price of other items is lower or higher by a certain percentage than the average price of the capital city, provinces or soums. - Determine whether there are missing values or null values. - Determine the outliers for each classification of goods and services in the database.
5.4 Edit & impute	According to the list of errors (protocol), identify each error as follows, and make necessary corrections manually: - Consider the descriptions and clarifications on pricing data in the pricing database - Contact the SME who collected pricing data for clarification - Clarify by comparing with databases of other periods etc. Carry out the substitution using data processing software. When making price substitutions, calculate the average of the prices collected in the reporting month and the base period, determine their changes, and multiply the prices of the previous month by the average price changes. Also, the price substitution is done explicitly. Index substitution is done implicitly.
5.5 Derive new variables & units	No new variables or units will be created in the CPI database.
5.6 Impute sampling weights	A sampling weight or consumption weight is pre-calculated and entered into the database.
5.7 Calculate aggregates	The individual index, subgroup index and element group index are calculated and entered into the database.
5.8 Finalize database	Check whether the CPI database is fully merged, classified and coded, recheck for any database errors, and make the database ready for analysis.
6. Data analysis	
6.1 Prepare output design	The time series is created by removing the seasonal variations in the CPI and linking it to a base period. Prepare descriptive texts, methodological notes, tables and charts for statistical bulletins, presentations and yearbooks.
6.2 Review and validate the output	Substitutions are made as needed, calculations of individual, subgroup and group indices and total index are checked for overestimation or underestimation.

	Make sure that seasonal variations are eliminated and time series are created by correctly linking them to the base period.
6.3 Interpreting the output	In accordance with the model included in the statistical bulletins, presentations and yearbooks, prepare a descriptive text interpreting the monthly indicators and methodology of the CPI. Interpret the factors affecting CPI changes for a given month, increase of prices of products and services resulted to the overall CPI increase, and the general trend of the CPI time series etc. (the paragraphs 13.19-13.23, Chapter 13. Publication, dissemination and user relations, "Consumer Price Index Manual: Theory and Practice", International Labor Office, 2004[26]).
6.4 Implementing data privacy controls	In accordance with the regulations of the NSO, the SME in charge of pricing data shall ensure the confidentiality of information at all phases from data collection to dissemination; prevent the suppression and misuse of information, and in the event that users receive incorrect information about the CPI from other agencies, make official explanations and corrections.
6.5 Finalizing the output	As specified in the sub-process "Finalizing the output", check whether the actions such as review & validate the output, edit & impute, and ensuring data confidentiality etc. have been completed, and make dissemination products ready for production. Based on the results of ensuring data confidentiality and review & validate the output, determine the level of data release, and apply caveats. In particular, the consumer price index will be reported at the group level etc. Prepare descriptions, technical notes and briefings to be reflected in census summary reports and thematic survey reports, and make them ready for inclusion in these reports.
7. Dissemination	
7.1 Update output systems	Prepare relevant data and databases for loading the CPI into the following dissemination systems: - Integrated Statistical Database[27] - 20 types of result tables, and 2 types of cartographic data in geographic database.
7.2 Creating statistical products and services	Prepare the printed dissemination products or statistical bulletins, presentations and yearbooks of the CPI in accordance with the proposed content, template format and requirements. Moreover, develop promotional materials for the CPI such as brochures, posters and summaries with infographics etc. Produced statistical bulletins, presentations, yearbooks and promotional materials will be reviewed at the appropriate phases, and corrected if necessary, and make them ready for data dissemination. Non-printed dissemination products or downloadable statistical tables, data and microdatabases will be loaded to the above database.
7.3 Manage release of dissemination products and services	According to the master plan for the dissemination of statistics, determine the date & time of the press release of the CPI. The CPI will be communicated to the public via press releases, presentation workshops and data dissemination through the media etc. It also defines the release date and plan of the dissemination product, press release of the dissemination product, procedure for communicating with users, dissemination channels and data content etc.
7.4 Promoting statistical products and services	Define guidelines for promoting dissemination products of the CPI, promotional materials for dissemination products, content, templates, promotional activities and channels etc., and carry out activities for promoting statistical products and services, accordingly.
7.5 Manage user support	The Department of Economic Statistics will develop and implement guidelines for collecting and responding to user feedback and demands concerning dissemination products of the CPI. When promoting and disseminating the CPI as planned, record & document user feedback and demands, and take & implement necessary actions. This documentation is an important data source that should be considered during the evaluation phase and when updating concepts of the CPI. Guidelines for collecting and responding to user feedback and demands will set the boundaries for collecting and responding to user feedback and demands. This sub-process also develops and disseminates a data quality report for the users of the CPI.
8. Evaluate	

[26] "Consumer price index manual: Theory and practice", International Labor Office, International Monetary Fund, Organization for Economic Co-operation and Development, Statistical Office of the European Communities, United Nations, The World Bank, 2004

[27] www.1212.mn

8.1 Gather evaluation inputs	The CPI data will be disseminated on a monthly basis, and once a full year or 12-month data dissemination is completed, an annual evaluation sub-phase will begin. The input for evaluation is the quality indicator data recorded in each sub-process, and the following data will be mainly considered: - Activity report for the phases from "Design" through to "Disseminate" - Monitoring report for the checks carried out during the data collection of CPI - The results and conclusions on errors and problems detected during the "review & validate" activities carried out in the sub-process "Design processing and analysis", - Feedback and demands collected during the sub-process "Manage user support", their consideration and implementation of the necessary measures.
8.2 Conduct evaluation	The statistical business process for the CPI is evaluated annually as follows: - Evaluation and conclusion on the activities planned during the "Design" phase, compared with the implementation of the phases from data collection through to dissemination. - When planning the sampling frame and sampling design, consider the implementation status of guidelines and recommendations of the "Consumer Price Index Manual: Theory and Practice", International Labor Office, 2004[28] - The results and conclusions on errors and problems detected during the "review & validate" activities carried out in the sub-process "Design processing and analysis", and their reasons Evaluation is carried out by comparing target indicators with performance indicators, and giving an evaluation.
8.3 Agree an action plan	Based on the evaluation result, develop an action plan to improve statistical business processes on the CPI for the next year by specifying corresponding phases, sub-processes, responsible departments, employees and timings etc. The relevant SME in charge will develop an action plan to improve the CPI for the next year for discussion and approval by the Methodological Standing Committee and the Chairperson's council meeting.

[28] "Consumer price index manual: Theory and practice", International Labor Office, International Monetary Fund, Organization for Economic Co-operation and Development, Statistical Office of the European Communities, United Nations, The World Bank, 2004