



# **Statistical Business Register Maturity Model - DRAFT**

**Joint production of:**

Task Team Capacity Building

Task Team Exhaustive Business Registers

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# 1. Introduction

The Task Team on Exhaustive Business registers defined its main goal as developing guidance for the Statistical Business Registers (SBR) to become more inclusive and exhaustive in a rapidly changing economy and to be better tailored to statistical production. In the original approach as described in the Terms of Reference we decided to first develop a strategic view of a SBR. This would be followed by a gap analysis and guidance to help bridge the gaps.

Early discussions in the Task Team showed that the interpretation of 'exhaustive' differs amongst countries and is heavily depending on the stage of maturity of the SBR.

One of the side-goals of this Task Team is to keep everyone on board, meaning that the contribution of each Task Team member can be one of give and take, so that membership is profitable for all. A first step was taken to temporarily split up the Task Team into two subgroups where the first group focused on the identification of different challenges across countries depending on the stage of maturity of SBRs and the second group focused on the strategic role of SBRs with respect to emerging economic activities. Both groups produced useful inputs as input into the future work of this Task Team.

In this document we want to sketch the possible way forward for this Task Team. Based on the input that has been collected during past meetings, including the Committee meeting in June 2019 in New York, we think it is possible to outline the first contours of a strategic view of an SBR. This strategic view can be seen as the dot on the horizon, having in mind that there will always be new developments in society and economic activities that urge us to adapt in order to stay relevant as producers of Business Statistics. After all, SBRs are the backbone for producing economic statistics that meet the increasing demand for better integrated, coherent and comparable statistics across countries and statistical domains, and this is described in our Terms of Reference. To keep track of the user requirements for exhaustive business registers it is recommended that we seek close cooperation with the Task Team on Business Dynamics, Demography and Entrepreneurship and the Task Team on Globalization and Digitalization.

Having a dot on the horizon in mind the possible gap between the current situation and the desired future situation may be considered too big and even impossible to reach with only some uniform guidelines. That is why we also want to sketch the outlines of a Maturity Model for SBRs. This model was mentioned during the meeting in New York in 2019, and the initial development was commenced by the Task Team on Capacity Building. The work as laid down in this document has been the result of close cooperation between the two Task Teams<sup>1</sup>.

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<sup>1</sup> Task Team on Exhaustive Business Registers and Task Team Capacity Building

## **2. A dot on the horizon**

### **2.1 Introduction**

In order to achieve the goal as mentioned in the previous chapter, the Task Team decided to produce a strategic view on SBRs. In this chapter we draft the first contours of such a view, based on the discussion in the Task Team and specifically the Task Team WebEx meeting at the end of October 2019. Also the information collected during the Committee meeting in June 2019 is included in the analysis. A lot of information is already available in a wide spread of documents, and everything is combined in the dot on the horizon.

A dot on the horizon in this context could mean a sketch of the ideal situation in terms of the requirements and roles of an SBR, and it could serve as a target situation for future developments in the SBR regardless of the current stage the SBR is in.

### **2.2 Roles of the Statistical Business Register**

It is important to highlight that the SBR is the backbone for producing economic statistics that meet the increasing demand for better integrated, coherent and comparable statistics across countries and statistical domains. These statistics should describe also new phenomena like globalization, digitalization, well-being, sustainability and the gig economy. With these new demands, an inclusive and exhaustive SBR becomes an increasingly more important element of the statistical infrastructure for maintaining the relevance, responsiveness and quality of economic statistics in order to measure the structure and dynamics of economic activity.

While business statistics should achieve these new and enlarged goals, it should do so in an efficient way and aiming for a response burden as low as possible. This means efforts must be made to modernize production processes, to use administrative data to reduce survey burden, to redesign survey systems, to harmonize surveys and variables, to comprehensively link administrative data and survey sources, and to cooperate more closely with administrative authorities on a continuous basis to improve the quality of the SBR. Better consistency between the various statistical areas at national and international level has also become a much more important goal than it was in the past, when the economic development was less affected by international dependencies, and globalization of production and markets was at a lower level.

In all these business statistics developments, the SBR plays a key role. Therefore, the challenges of current and future business statistics are at the same time also challenges for the SBR. The SBR delivers the basic information for conducting economic surveys by providing the populations of statistical units and their characteristics, for national business or globalization related statistics. It also serves as the central data source for querying legal units, enterprises or enterprise groups. Further, the SBR provides links to administrative units and registers, as a central data source, thus enabling the use of administrative data for statistical purposes. It also provides unique identifiers enabling linkages at the micro-level across statistical domains that are needed for producing national and international statistics. And finally it is the central data source for statistical

analysis and calculations, identification and delineation of units, definitions of weightings and micro-data linking

The basic roles that the SBR plays for the production of business statistics has a significant effect on the national accounts, which needs high quality and consistent business statistics to achieve its goals.

High quality business statistics depend on a high quality SBR. A high quality SBR fulfils the user needs in an optimal way, and is based on international concepts, definitions and classifications. Thus, it also serves as the basis for international harmonization of economic statistics in terms of coverage, statistical units and frame methodology.

### **2.3 Requirements of the Statistical Business Register**

Some of the important requirements for a SBR are that it reflects the real world and can be maintained. The SBR is often described as the backbone of economic statistics as it provides the core infrastructure to support the collection of economic data and the production of economic statistics. Specifically, the SBR is the coordinating mechanism as it provides a coherent set of units and classifications to collect and assemble data across all domains. While the backbone is a general concept, it has usually been implemented by integrating data into a structured database. To prevent the SBR from storing redundant information and to provide more flexibility to integrate data with the SBR in the future, a “spine” data model has been developed. The spine data model also supports inter-operability between registers.

In the spine data model, registers are no longer held in a single structured database. Rather they are created virtually via data linking. The spine is the minimum set of information (e.g. identifiers and the relationships in the economic units model) required to link two or more datasets, and there is a separation between data inputs, the spine and data outputs. Under this approach the SBR becomes a register environment rather than a stand-alone register. The register environment includes the core register input datasets (not integrated), the spine and the business rules and views that use the spine to transform data inputs into integrated data outputs. The supporting environment must be sufficiently flexible to enable new datasets to be related to the spine as they are created or obtained. To support coherence within the data, all economic collections should either source their frames from the SBR or be linked to the SBR.

Although the core of an SBR should be lean and mean, its coverage should be maximized. That is, an SBR should record all institutional units in the national economy that are engaged in productive economic activities, i.e., activities contributing to the gross domestic product (GDP). A national economy can be divided into three parts: the formal sector, the informal sector, and household non-market production for own final use. In the ideal situation the first two parts should be fully covered by an SBR. In reality, complete coverage of all these units within the SNA production boundary is impossible to achieve. However, for the purposes of international comparisons, it is desirable that the coverage of an SBR should meet agreed standards, with completeness being the ultimate aim.

Aiming for completeness will lead to new challenges that will not be addressed by only relying on conventional methods, administrative sources and the traditional survey-based approach. The digital transformation, data revolution and emergence of “big data” all influence the way NSOs collect data. Data are everywhere, generated by everything and everyone. These developments around us should be seen as new opportunities for enrichment of existing datasets, characterization of enterprises and determination and differentiations of subpopulations, noting new approaches need to be repeatable. To take advantage of all the potential opportunities associated with future advanced data collection approaches, much development still needs to take place.

## **2.4 International cross border data linkage**

The above discussion primarily relates to SBRs at the national level. However, the increasingly global activities and structures of enterprises challenge the integration, coherence, consistency and comparison of business- and macroeconomic statistics across countries and across statistical domains. This asks for a structured solution where cross border relationships and activities of the most important multinational enterprise groups (MNE) can be stored, maintained and made available for compiling statistics on cross border phenomena. In the European context the EuroGroups Register (EGR) is the joint tool in the European Statistical System (ESS) for the coordination of basic information about MNEs from the EU Member States’ SBRs. Based on input from the Member States the EGR links and processes data creating the global structures of MNEs resident in the EU and their constituent legal units. The activities of MNEs however are not bound to the European border and in the ideal situation a new Global Group Register would be very welcome. A future Global Group Register should focus on its comparative advantages to the national SBRs, providing insight into the structure of internationally operating MNEs that cannot – or only with huge efforts – be achieved solely at the national level. It fulfils an infrastructural role by connecting the national master frames of SBRs in countries worldwide by allowing linking of information from all national SBRs through the use of a unique identifier.

## **2.5 Summary**

As a summary of the dot on the horizon, we would like to highlight the most important elements and requirements:

- The SBR is the backbone for business statistics
- The SBR plays different and important roles in creating business statistics and supporting emerging data challenges
- The SBR represents the real world and is maintained over time
- A spine model is a future data model, meaning a lean and mean core and linkage to other datasets
- The core contains at a minimum, unique identifiers to combine data, at the national level and ideally the international level
- Completeness/full coverage is the ultimate goal, while maximizing coverage is the second best solution (incl. the informal sector),

- If using a spine approach, new data sources should be integrated using the SBR (i.e. administrative data, big data)
- A global group register increases cross border integration and quality

## 3. Statistical Business Register Maturity Model (SBRMM)

### 3.1 Purpose of use

In the previous chapter we tried to sketch a future view of a SBR that can stand the test of time. At the same time we have to remember that the current state of an SBR and associated development differs across countries. With a SBR Maturity Model we hope to create a central repository of knowledge where all NSOs, regardless of the SBR starting point, can get information and learn from best practices in other countries in order to improve or change their SBR to fulfill user needs. On top of that we have to realize that the world of SBRs is not a static one and it is important to adapt to changes in technical possibilities and economic behavior. This highlights the need for solid maintenance of the SBR Maturity Model in the future.

Having that in mind, the Statistical Business Register Maturity Model is supposed to be a tool to:

- share knowledge and best practices
- determine the current state of your SBR
- determine possible next steps for development
- find help and guidelines to actually be able to take those steps.

### 3.2 Maturity and maturation

The SBRMM describes the different levels / stages of an SBR by a number of dimensions. For each dimension, each stage is described by characteristics that are typical for a certain level.

Stages progress from 'Preliminary', to 'Early', 'Mature' and finally 'Advanced'. The Advanced level is currently closest to the dot on the horizon as described earlier in chapter 2. In the future it is conceivable that the number of levels could increase in line with new insights and developments. A rough guideline could be that a new level should be substantially different from the previous one such that it makes sense to distinguish the different levels.

Each stage can be defined by characteristics and requirements that are specific for that stage. When the SBRMM is in place, it is important that an NSO is able to assess the level that applies to its SBR. To facilitate this, checklists can be developed for performing self-assessments. Notice that the individual dimensions of a specific SBR may be assessed to be at different stages.

The strength of using a SBRMM is that we are now able to define specific guidance on how to move from one level to the next. In fact, it is possible to define guidance for specific characteristics and requirements. A lot of material is already available and can be re-used to define the guidelines needed. The guidelines should give practical advice on the development and implementation of characteristics and requirements.



The SBRMM should ideally be built in an online environment, so that its contents are easy to maintain and the model itself is dynamic based on the latest developments and insights. Existing material can easily be re-used by linking to its location. See below for a conceptual visualization of the SBRMM.

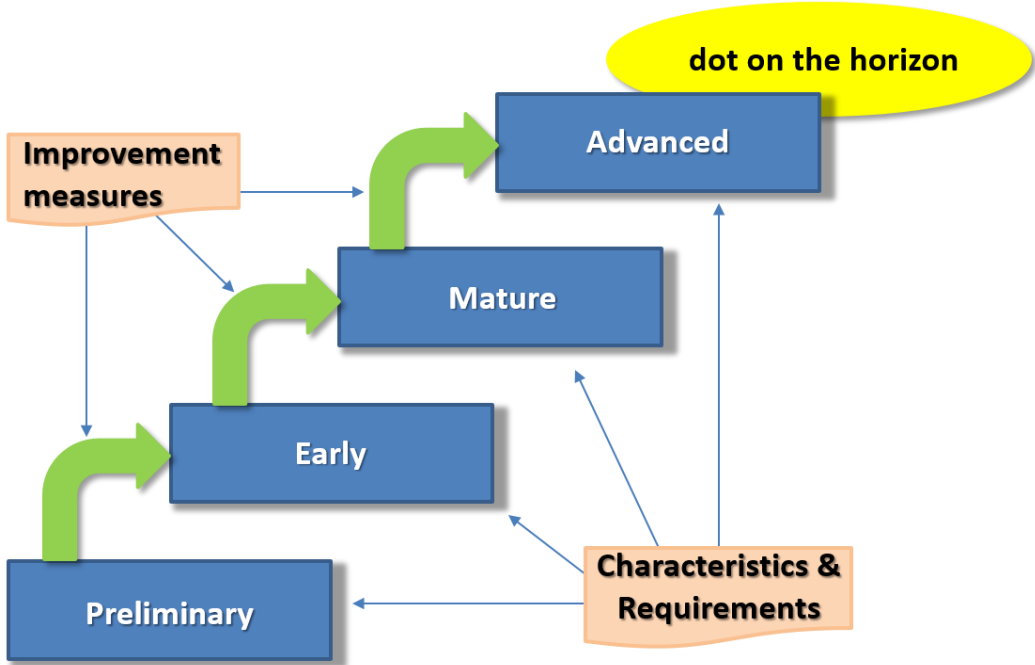


Fig. 1: Conceptual visualization of the SBRMM

## 4. Dimensions of the SBRMM

### 4.1 Overview

When designing dimensions and stages for a SBRMM, we took note of the Generic Statistical Business Process Model (GSBPM<sup>2</sup>). The GSBPM provides a framework of all the business processes needed to produce official statistics. For economic statistics, population frames provided by the SBR are a crucial instrument to describe economic indicators about relevant business populations and to design an efficient data collection process. Therefore, the dimensions of the SBRMM should describe the most important conditions affecting the basic design principles for populations, survey frames and data collection in the GSBPM. The stages provide an insight of the maturity status of a particular dimension. The combination of both dimensions and stages aims to help develop efficient design principles in the business architecture for use by an individual NSO. In this respect, the SBRMM then becomes an instrument for improvement<sup>3</sup>.

Table 1: overview of the dimensions of the SBRMM.

N	Dimension	Description
1.	Legal and institutional framework	This dimension includes the legal and institutional framework relevant for establishing and maintaining the SBR.
2.	Data sources for the SBR	This dimension includes the various data sources that the NSO can use to build and maintain the SBR.
3.	Maintenance and update of the SBR	This dimension includes the maintenance and update procedures for the SBR, and in particular the operational requirements of maintaining effective and reliable systems.
4.	Coverage of the SBR	This dimension includes the coverage of the businesses in the SBR
5.	Use of SBR	This dimension includes the use of the SBR, both by external users and internally within the NSO.
6.	IT Environment	This dimension includes the IT environment that supports the data storage, maintenance, update and dissemination of SBRs.
7.	Interoperability	This dimension includes the ability of an SBR to communicate and exchange standardized data

<sup>2</sup> <https://statswiki.unece.org/display/GSBPM/GSBPM+v5.1>

<sup>3</sup> <https://aisel.aisnet.org/ecis2011/28/>

		with other registers, be they domestic, regional, or global.
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The stages of the SBRMM follow the maturity levels of the Capability Maturity Model (CMM<sup>4</sup>) and aim to improve the development processes for SBRs. The CMM defines 5 maturity levels. For the SBRMM, we agreed to define 4 maturity stages.

Table 2: CMM overview of the stages of each dimension.

N	Stage	Description
1.	Preliminary stage	<i>“It is characteristic of processes at this level that they are (typically) undocumented and in a state of dynamic change, tending to be driven in an ad hoc, uncontrolled and reactive manner by users or events.”</i>
2.	Early stage	<i>“It is characteristic of processes at this level that there are sets of defined and documented standard processes established and subject to some degree of improvement over time.”</i>
3.	Mature stage	<i>“It is characteristic of processes at this level that, using process metrics, effective achievement of the process objectives can be evidenced across a range of operational conditions. The suitability of the process in multiple environments has been tested and the process refined and adapted.”</i>
4.	Advanced stage	<i>“It is a characteristic of processes at this level that the focus is on continually improving process performance through both incremental and innovative technological changes/improvements.”</i>

In the next paragraphs, the dimensions and the stages for each of the dimensions are elaborated. In defining the different stages for each dimension, some elements have been taken from the Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance<sup>5</sup> (Handbook on CRVS). The Handbook on CRVS takes a holistic systems approach covering civil registration, vital statistics, and population registers, and they identify management as well as issues related to the

<sup>4</sup> [https://en.wikipedia.org/wiki/Capability\\_Maturity\\_Model](https://en.wikipedia.org/wiki/Capability_Maturity_Model)

<sup>5</sup> <https://unstats.un.org/unsd/demographic-social/Standards-and-Methods/files/Handbooks/crvs/crvs-mgt-E.pdf>

structural design, business processes, infrastructure, management and operations of an integrated system for registration, issuance of legal documents, register development, and compilation of statistics.

## 4.2 Dimension 1: Legal and institutional framework

This dimension refers to the legal and institutional framework relevant for establishing and maintaining a SBR.

It would be expected that there is a National law can:

- establish a regular Economic census, and/or
- arrange access to and use of an administrative data source (e.g. Chambers of Commerce, access to administrative Business Registers)
- establish the use of a unique identifier for businesses

The legal framework for SBRs depends very much on the country's constitutional framework and the institutional arrangements for SBRs (e.g. centralized vs decentralized system). In addition, it is important to understand the hierarchy of the laws in order to provide guidance on improving the legal framework for SBRs, such as "laws", "legislation" "regulations", "instructions", "policy" and "Memorandum of understanding".

A Memorandum of Understanding (MoU) with public or private partners to guarantee access to and use of necessary administrative data, can serve to complement (or even replace) the legal framework.

The *Guidelines on the Legislative Framework for Civil Registration, Vital Statistics and Identity Management*<sup>6</sup>, notes that the legal framework can cover the following aspects: business registration; business registers; unique identifiers, data protection and privacy; compliance, enforcement, rights and remedies; and transitional provisions. Specific guidelines on the legislative framework for SBRs could be developed using the CVRS as the model the UN Guidelines.

Legislation in an international or regional context can also be considered, such as regulations at European level.

### 4.2.1 Preliminary stage

There is no legal framework and/or MoU in support of SBRs.

### 4.2.2 Early stage

There is a legal framework and/or MoU that enables an economic census to be conducted and used. Conducting a census often depends on a large network of enumerators to collect information, data entry staff and managers to guide this process. Hence the legislation needs to be supported by appropriate funding. An administrative

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<sup>6</sup> UN 2019. Available at [https://unstats.un.org/unsd/demographic-social/Standards-and-Methods/files/Handbooks/crvs/CRVS\\_GOLF\\_Final\\_Draft-E.pdf](https://unstats.un.org/unsd/demographic-social/Standards-and-Methods/files/Handbooks/crvs/CRVS_GOLF_Final_Draft-E.pdf)

business register may or may not be available in the country. Where it is available access may not be guaranteed by law.

#### **4.2.3 Mature**

There is a legal framework that ensures by law the registration or inclusion of businesses into a SBR. This framework also ensures regular access to and use of all necessary census, administrative business register and/or other administrative data. Hence legal agreements and MoUs with several source owners (e.g. ministry of finance) are covered by the legislation. Important drivers are the requirement to be more efficient, improve data quality, reducing administrative burden and obtain more detailed information at an earlier stage. The law guarantees a complete and efficient functioning of the administrative business register and ensures access by the NSO. The use of administrative data in statistical production is mandatory where this is available. Using a survey as an instrument to collect data with respondents is only permitted where information to produce reliable indicators is not available in administrative sources. The legal framework covers aspects of business registration (enforcements of registration of new business (business births) and the cessation of businesses (business deaths); unique identifiers of business in registers; data protection and privacy; compliance, enforcement, rights and remedies; and transitional provisions. Access to microdata services of the NSO are granted for public organizations for statistical purposes only, but not accessible for commercial users from outside the NSO.

#### **4.2.4 Advanced**

There is a legal framework that ensures regular access to and use of all necessary census, administrative business register, and/or other administrative data. A MoU with partners can fortify the legal framework. The legislation on data protection and privacy allows the NSO to disseminate selected information in the SBRs. In an international context, regulations are in place to ensure the exchange, use and integration of national data, to create an international SBR (e.g. the GGR built similarly to the EGR). The sharing of statistical information or micro data with (commercial) users outside of the NSO is arranged by legislation subject to the appropriate confidentiality. Businesses are granted access to their information stored in the SBR and are allowed to update relevant information about their own organization. Web scraping can be used for statistical production when it is not in conflict with other legislation.

### **4.3 Dimension 2: Data sources for the SBR**

This dimension covers the various data sources that the NSO uses to build and maintain the SBR. The data sources depend greatly on the country's situation and availability of relevant information from other institutions. Therefore, the choice of the best data source depends very much on the specific context of a country. However, there are clear benefits to the SBR when high quality administrative data are available and can be exploited for use in the SBR.

Efforts in improving the quality and timeliness of the SBR go hand-in-hand with the improvement of administrative data.

The availability and use of data sources will be a strong determinant of the maintenance process and effort.

#### **4.3.1 Preliminary stage**

As there is no SBR / Economic Census available, there is no up-to-date comprehensive data sets on establishments/ enterprise/ business units for statistical purposes/uses. Scoping exercises may be underway.

#### **4.3.2 Early stage**

The construction of the SBR depends mainly on the economic census together with maintenance surveys.

No profiling or substantial data confrontation with other sources is undertaken. There may be a periodic economic census used to update the SBR, but in general the maintenance procedures run on a reference period with a significant lag. This hampers the survey data collection. An assessment of the availability and quality of administrative data for SBRs is being undertaken in the country.

#### **4.3.3 Mature**

The SBR is updated on a sub-annual basis using mainly administrative sources, such as business registrations, taxation data, etc. Dedicated SBR surveys, direct contact with businesses, and other government sources are also used to update and validate the SBR. Data collection is more efficient because the maintenance procedures applied are close to the actual reference period. Operational rules enable the integration and transformation of administrative data into statistical units. There is a nationally consistent unique identifier used to maintain and identify economic units from a whole of government perspective. More attention is given to national and possibly international profiling.

In this stage, the SBRs is updated on a continuous and frequent basis and reflects almost in real time the 'events' that are recorded in the administrative data

#### **4.3.4 Advanced**

There are multiple sources used to update the SBR on a sub annual basis as in the mature stage. Where there is enabling regional legislation, data from other countries can be used to update the SBR. In the advanced stage commercial data sources are also used in the maintenance strategy of the SBR. Web scraping and data mining techniques are also used to improve or to verify the content of the SBR. International coordination is optimized resulting in cooperation and data sharing between countries.

### **4.4 Dimension 3: Maintenance and update of the SBR**

This dimension of the maturity model focuses on the maintenance and update procedures for the SBR and in particular to the operational requirements of maintaining effective and reliable systems.

The operational requirements of a maintenance program include the modification of records; internal review of the system's functions; preservation of stored records; and

the maintenance of field operations. Modernizing and maintaining the operational requirements is a prerequisite of contemporary functions of NSOs, essential to improving services to the public<sup>7</sup>.

Part of the maintenance of the SBR includes the digitalization and automatization of procedures. However, these aspects are elaborated under the IT dimension of the maturity model. In this dimension, the focus is on the following aspects<sup>8</sup>: modification of records (e.g. methods of making changes to the records, the ways of maintaining the integrity of the records, and keeping a log of all such changes); preservation of stored records (e.g. procedures for storing and preserving records); internal review mechanisms for system functions (e.g. internal review mechanisms that should be put in place to maintain the uninterrupted functioning of systems and to detect aberrations); validation procedures; and the frequency of updates to the SBR (e.g. frequency of updates).

The methods used and the level of effort required will be highly dependent on the main data source(s).

#### **4.4.1 Preliminary stage**

Effectively no maintenance activities undertaken as there is no SBR / Economic Census available. Scoping exercises may be underway.

#### **4.4.2 Early stage**

Methods of making changes to the records, the ways of maintaining the integrity of the records, and keeping a log of all such changes are being developed. Procedures for storing and preserving records is not in place and internal review mechanisms for system functions may or may not be elaborated.

Validation procedures are not regularly done and when in place are ad-hoc and highly manual. This is either due to a lack of resources or a lack of suitable data sets for confrontation (lack of developed unique identifier, databases or legal authority to collect available information). There may be updating of the economic census frame using feedback from surveys but this is not from a dedicated SBR survey. The SBR team is relatively small compared to the population of the country and national statistical office. The SBR is not updated on a regular basis.

#### **4.4.3 Mature**

Methods of making changes to the records, the ways of maintaining the integrity of the records, and keeping a log of all such changes are well developed and documented. Similarly, procedures for storing and preserving records and internal review mechanisms for system functions are well established and functioning. Validation procedures are done on a regular basis by confronting the multiple sources used to update the SBR (on an at least an annual basis); such as business registrations, taxation data dedicated SBR surveys, direct contact with businesses, and other government sources. There may also be a periodic census used to update the SBR as

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<sup>7</sup> Based on para 228 of the Handbook on CRVS (<https://unstats.un.org/unsd/demographic-social/Standards-and-Methods/files/Handbooks/crvs/crvs-mgt-E.pdf>)

<sup>8</sup> The first 3 are taken from Chapter III of the Handbook on CRVS.

well. The primary data sources are used to update the SBR on a regular basis at sub annual frequency.

Maintenance procedures are in place to integrate and transform administrative data into statistical units through profiling. There is a profiling team which engages with the largest and most statistically significant organizations for a nation's economy. Common issues preventing this SBR from becoming advanced can be: lack of legal authority to access other government databases, lack of resources to expand profiling / data integration or lack of government databases that can be efficiently accessed (due to either lack of unique ID for matching, data items not being maintained or incoherence between administrative data and the economic units model).

#### **4.4.4 Advanced**

The SBR is updated on a sub-annual basis in line with the updates from the data sources. There is a nationally consistent unique identifier used to maintain and identify economic units from a whole of government perspective. This is a necessary condition to have an advanced SBR from a maintenance perspective. The government databases include all key data requirements for the SBR. The SBR combines / integrates data from many sources so that it reflects the real world, in terms of births, deaths, changes in key stratification variables, contact details, etc.. Such a system may have one data item derived from one administrative source but many other key data items derived from others; with the NSO determining the rules depending on reliability and timeliness. The data items are all derived based on the economic unit's model.

Profiling covers a substantial proportion of a countries economic activity in terms of industry value add. Profiling ensures that where there are significant contributors to economic activity in a particular industry, reporting units are set up to report on that activity, regardless of the legal entity structure. Profiling uses timely administrative data to identify units for investigation; for both new units or to identify changes to existing units. Detailed unit record level reports are created which explain all key changes and are made available to all internal stakeholders.

### **4.5 Dimension 4: Coverage of an SBR**

This dimension refers to the coverage of businesses included in the SBR. This can be evaluated in terms of the proportion of economic activity represented by the units in the SBR as a share of total economic activity in the country. The coverage of the SBR can also be view in terms of what sectors of the economy are included, for example, formal and informal activities, entities of different sizes (e.g. small, medium and large enterprises), geographic coverage, etc..

This dimension also refers to the coverage in terms of variables recorded for each entity.

The coverage of the SBR is highly dependent on the quality of the coverage of the available data sources and also on the broader legal framework (e.g. If it is compulsory for businesses to register and can the NSO access the administrative data).



#### **4.5.1 Preliminary stage**

The coverage of units and variables is to a large degree dependent on the contents in the data source (e.g. economic survey, admin data). The business register unit has no, or limited ability to affect this.

Coverage of units: There is no SBR / Economic Census. Coverage of the formal sector is still being explored. There is no method to measure or estimate coverage.

Coverage of content / variables: Coverage of structural data items is captured in economic surveys as there is no SBR.

#### **4.5.2 Early stage**

If not collected, an identifier should be created by the NSO in order to be able to track units over time and to link units between surveys. Some core variables are collected, plus potentially some other variables that are not relevant for the SBR embryo state

Coverage of units: Coverage of establishments in the formal economy is high at a point in time via periodic economic census (non-agriculture economy). The coverage degrades over time as regular maintenance procedures have not been established. There are limited sources and so checking coverage is difficult.

Coverage of content / variables: SBR includes core data items (e.g. name, head office address / contact, industry, sector, size and active status), and unique statistical identifier (created by the NSO if not available from admin source). Geographic data covers state breakdowns at enterprise level.

#### **4.5.3 Mature**

The units in the SBR at this stage should be at least the legal unit and the local unit or establishment. Linking of units is key in order to make use of information from multiple sources and to relate the information to the economic units model. The variables attached to each unit follow international recommendations to a large degree (regarding core variables). Documentation and quality descriptions in line with international guidelines should exist for units and variables. An estimation of the size of the informal economy should be calculated if relevant.

Coverage of units: Administrative sources provide partial coverage of in-scope units and the coverage is updated annually. The coverage is managed within the integrating framework of an economic units model (eg. relates real world and statistical units). An economic census may still be conducted periodically as a benchmark where administrative data is not sufficient. Methods for measuring or estimating coverage against other data sources is possible.

Coverage of content / variables: SBR includes core variables plus unique statistical identifiers (administrative and NSO). Geographic data includes a location unit (locality breakdown).

#### **4.5.4 Advanced**

All statistical units (ie. not only legal and local unit/establishment) together with all variables needed for business statistics are in place in the SBR, and are interlinked to

each other. Documentation exists that is in line with international standards and which provides users with relevant information.

Coverage of units: Administrative sources provide full coverage of units in the formal economy and the coverage is updated on a sub-annual basis. There may also be some coverage of the informal sector.

Coverage of content / variables: SBR includes a broader range of data items (eg. unit level characteristics, globalization indicators etc) and ideally any whole of government identifiers that are available. Geographic data includes address, location and activity breakdowns. Some data items are modelled based on administrative data.

## **4.6 Dimension 5: Use of SBR**

This dimension describes the use of the SBR, both by external users and internally within the NSO. It focusses on how well the SBR meets the needs of its users and the significance of the SBR for the organization. The use of the SBR in statistical processes will probably depend on the stage of maturity of the other SBR dimensions. Confidentiality is also a key consideration.

### **4.6.1 Preliminary stage**

In the preliminary stage each data item is based on a stove pipe process, and mainly based on surveys. The SBR refers to a list of known companies composed by manual investigations of different sources (e.g. census). Hence the time-lag in the reference period often lags more than 2 years. The economic units model has not been implemented and the frame development process is not standardized across the economic statistics program. The SBR may be used to supplement a stove pipe survey frame process.

### **4.6.2 Early stage**

The SBR can only be used to supplement a stove pipe survey frame process. This may be because administrative sources are unable to be linked using a unique identifier, or because the input sources are not mature leading to coverage issues or double counting of units in the SBR.

The users of the SBR have limited involvement in the SBR development and maintenance.

### **4.6.3 Mature**

The SBR is used to create a snapshot / frozen frame from which all survey frames are drawn using the standardized economic units model and the unique identifiers. The SBR is integrated into the economic statistics chain management and the users of the SBR are involved in the maintenance of the SBR, including via feedback to resolve frame errors. The SBR can also support monitoring of survey response and burden.

The SBR is also used to create and publish business demography.

### **4.6.4 Advanced**

The survey frames supported by the SBR expand to include functional statistics, and tailor-made frames can also be developed (that still align with the underlying common frame) as different types of (digitally available) sources are available to expand the coverage of units or data items. The SBR users are involved in the maintenance of these expanded uses, including via feedback to resolve frame errors. A special web-portal supports the data collection of SBR data and the maintenance.

The SBR has a spine that can support micro data linking to other secondary sources and the development of data solutions. The advanced use of the SBR also includes de-identified data being made available external researchers or policy analysts.

The SBR is part of an (international) coordinated network of SBRs.

## **4.7 Dimension 6: IT Environment**

This dimension includes the IT environment that supports the data storage, maintenance, update and dissemination of SBRs.

### **4.7.1 Preliminary stage**

Limited lists of companies exist mainly on paper or as an excel sheet. There exists only a basic maintenance strategy. Feasibility studies may be underway, together with scoping exercises for main data sources.

### **4.7.2 Early stage**

The SBR consists of a simple database structure, containing the essential information from the main data source. No rules exist on the organization of the IT infrastructure or software.

### **4.7.3 Mature**

A Statistical Business Architecture is adopted and there is a software architecture which defines the requirements of the IT infrastructure and the software to build an IT system. The IT system consists of one or more SBR databases. Satellite registers (linking units in the SBR to other data sources, such as the population register) are supported. The IT environment supports the activities in the Business Architecture.

The IT environment also supports the inclusion and validation of records from the various data sources in the SBR as well as the data dissemination of statistics directly derived from SBRs.

### **4.7.4 Advanced**

The SBR Business Architecture in the mature stage is expanded to include new data science technologies such as big data, webscraping, datamining, graph databases and the cloud . This achieves more efficient storage and maintenance of the data. Special web portals are also supported for companies to update their information in the SBR or the surveys as required.

## **4.8 Dimension 7: Interoperability**

Interoperability refers to the ability of an SBR to communicate and exchange standardized data with other registers, be they domestic, regional, or global.

### **4.8.1 Preliminary stage**

No interoperability. A well-functioning SBR is sine qua non of interoperability.

### **4.8.2 Early stage**

The SBR is standalone (limited interoperability). The SBR receives data from its sources via a data import process that requires constant human intervention. A unique ID scheme exists in the SBR to identify each enterprise, but the scheme is not applicable in the data sources. Fuzzy matching by enterprise name and other key variables is used to link the SBR with data sources and other registers where unique IDs do not exist.

### **4.8.3 Mature**

A common Unique ID framework is used consistently to identify people (natural persons) as well as enterprises consistently across domestic administrative and statistical registers. Fully compliant with international standards and classifications, such as ISIC. Characteristics such as industry, size class, and revenue, are comparable internationally.

### **4.8.4 Advanced**

Micro data linking, such as linking business demography (BD) and trade by enterprise characteristics (TEC) data. Regional cross-country analysis is possible due to the harmonization of national SBRS that can exchange statistical information at the enterprise level. This can facilitate the sharing of a wide range of variables covering structural business statistics, international trade in goods and business demography.

The SBR can be linked with a range of other statistical registers including population registers, housing registers and address registers.

## 5. Assessment and development

### 5.1 Assessment of current situation of an SBR

The maturity model is not a tool to assign a single score to define the status of implementation of SBR in a country. It is rather a multidimensional model that helps to identify elements of the SBR that needs to be improved.

After the assignment of the stage for each dimension is completed, the implementation of the maturity model can be visualized with the radar chart below. The radar charts help to visualize the implementation of the SBR in a country and monitors the evolution over time. This part can be further elaborated with some specific examples once the dimensions and the stages of development are agreed upon.

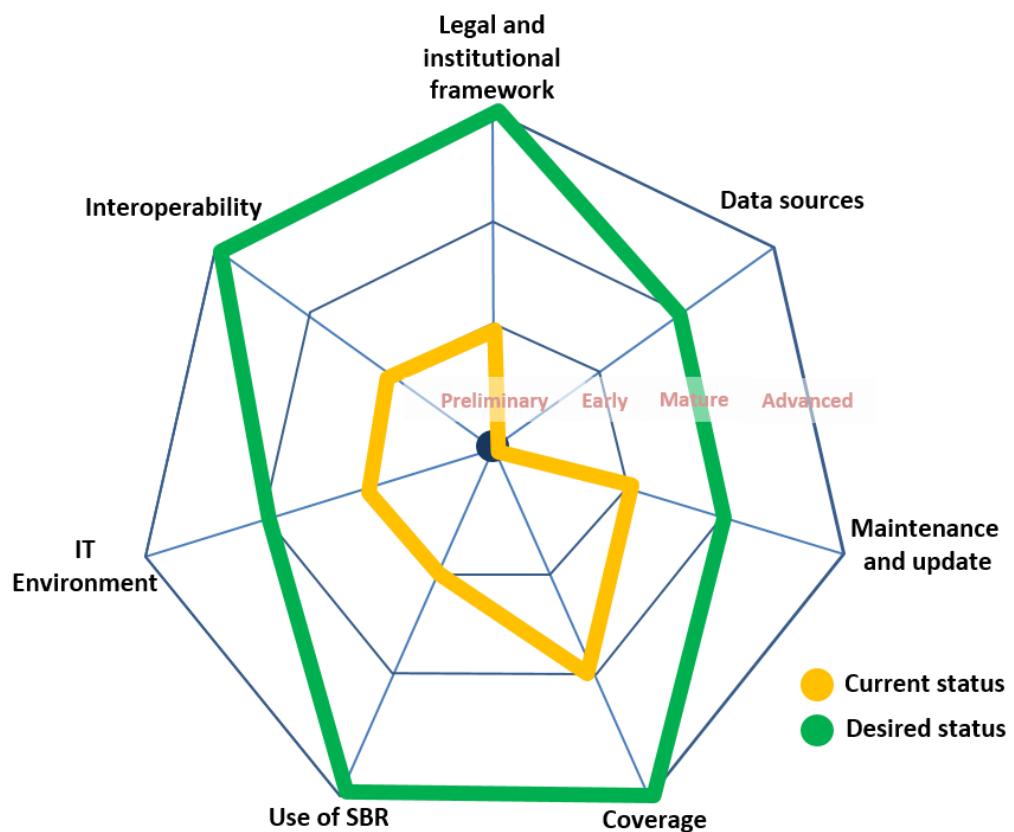


Fig. 2: Visualization of assessment results

But how would an NSO classify its SBR according to the SBRMM? It is proposed that a questionnaire should be developed as a guideline to help NSOs to assign the stage of each dimension for its SBR. A good example of a questionnaire for this purpose is the

survey conducted in 2013 by the UNSD. This is listed in appendix 2 of the UNSD-Report<sup>9</sup> on global status of statistical business register programs.

## 5.2 Improvement measures for each maturity level

The establishment of a 'modern' SBR is a basic part of the infrastructure to compile official statistics. The UNECE international guidelines in Statistical Business Registers<sup>10</sup> provide a lot of practical recommendations to design a SBR that is part of the broader statistical system and takes into account the legal framework, with the aim of supporting more efficient and coherent business statistics. Important pre-conditions for a 'modern' SBR are the existence of a legal business registration system and an identity management system. A legal business registration system comprises well-maintained and updated registrations of single businesses identified by a unique national legal unit identifier. Such a system requires specific legislation to support the use of technological communications devices for registration purposes, such as computers and the Internet, for the provision of public services to citizens and other persons in a country or region over the internet, better known as (e.g. 'e-government'<sup>11</sup>). The recommended core functions for such a business register system are listed in the UNCITRAL Legislative Guide<sup>12</sup>. However, the question for many NSO's is how to organize a national environment to get funding, knowledge and practical information to achieve this goal? The UNECE guidelines describe many practical organizational aspects, but the assessment of the maturity of a SBR aims to be a more structured starting point for improvements.

The aim of the assessment of the level of maturity of the SBR is not to judge a NSO, but to describe the present situation and be able to see what steps can or should be taken to develop the SBR to the next step in a certain dimension. So in the end, the SBRMM is a tool to help a NSO to find out what actions will lead to the improvement of (the use of) their SBR. Once the NSO has applied the maturity model to its SBR, it should then identify the actions that will help it transit to the next maturity level. Given that legislation, knowledge, and infrastructure as well as many other characteristics differ by country, it would be wise that the SBRMM also provide guidelines and describe general methods for a NSO to achieve the next stage of an identified dimension. Important instruments to improve a specific dimension are:

- Reference to specific passages in handbooks and guidelines
- Reference to documented best practices, like
  - Procedures and methods
  - Dialogue frameworks
  - Chain management
  - Partnerships
- Organization of workshops or Study Visits
- Adoption of Agile methodology or Lean Operational Management

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<sup>9</sup> [https://unstats.un.org/unsd/economic\\_stat/Economic\\_Census/globalSbrAssessmentReport.pdf](https://unstats.un.org/unsd/economic_stat/Economic_Census/globalSbrAssessmentReport.pdf)

<sup>10</sup> [https://www.unece.org/fileadmin/DAM/stats/publications/2015/ECE\\_CES\\_39\\_WEB.pdf](https://www.unece.org/fileadmin/DAM/stats/publications/2015/ECE_CES_39_WEB.pdf)

<sup>11</sup> <https://en.wikipedia.org/wiki/E-government>

<sup>12</sup> [https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/ig\\_business\\_registry-e.pdf](https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/ig_business_registry-e.pdf)

This list will be elaborated and finalized in the final version of the SBRMM.

## 6. Work still to be done

### 1 More iterations needed

We probably need more than one iteration to complete the first workable version of our SBR Maturity Model and we question if WebEx meetings are the most optimal way of progressing. If needed we could try to organize a workshop meeting (online) in order to speed-up the development.

### 2 Develop assessment questionnaire

After finishing the first real version of the SBRMM we need to develop a questionnaire that can be used by NSOs to assess the stage of maturity of the dimensions of their SBR.

### 3 Collect guidelines, best practices, tips and tricks

The next step is to make to SBRMM really supporting. For each transition from one stage of maturity to the following for each dimension we need to define guidance. It makes sense to make use as much use as possible of existing material.

### 4 Transform into an online version

5 We probably want to do this parallel to the activity of collecting guidance, so that we can make all guidance directly accessible to everyone.

### 6 Define a maintenance procedure

To keep the SBRMM as powerful as can be we finally need a maintenance procedure because our statistical and economic environment will always be evolving in time and hence new guidance will be developed.

### 7 Test, enhance and go live

The proof of the pudding is in the eating, so we need to test the model before going live.