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**Economic Commission for Europe****Conference of European Statisticians****67<sup>th</sup> plenary session**

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**Emerging role of national statistical offices as offices for statistics and data****Session 2: Approaches to data system stewardship****Decision making support system as a policy tool – Serbian experience****Note by the Statistical Office of the Republic of Serbia***Summary*

This document provides the overview of how the Statistical Office of the Republic of Serbia introduced and implemented the Decision-Making Support System as a policy tool, with the aim to provide a flexible instrument for analysis, monitoring and evaluation of the economic situation in Serbia, in order to facilitate the decision-making process. Taking such role in public policy management, the statistical system is becoming an active participant in public debate, instead of following the previous traditional, passive approaches, which included only producing a large amount of data. Nowadays, in democratic societies, official statistics are becoming more and more utilized, not only useful. The role of Statistical Office of the Republic of Serbia is to integrate statistics into public policies and to connect knowledge and expertise on one side with the political power on the other side.

This document is presented to the 2019 Conference of European Statisticians seminar on “Emerging role of national statistical offices as offices for statistics and data”, session 2 “Approaches to data system stewardship” for discussion.



## **I. Introduction – What is DMS? How we see it**

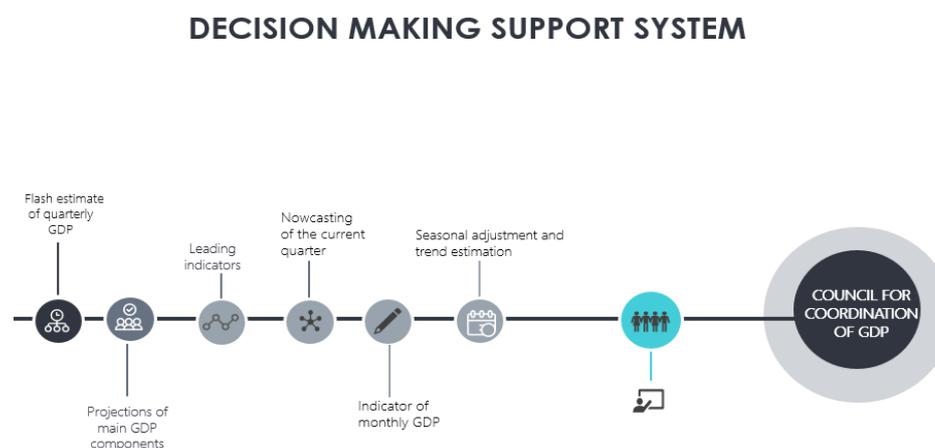
1. Nowadays, decision-makers face a large amount of data, which, absurdly, makes decision-making process even more difficult. Key economic indicators are mainly available at lower frequencies (i.e. at quarterly and yearly frequencies) – specifically, gross domestic product (GDP), as the key growth indicator is published 60 days after the end of the reference period, which hinders accurate estimation of the state of the economy. Obviously, there is a problem of lack of major economic data in real time.
2. The occurrences such as surplus and overload of data are typical of modern society. A question arises: how to extract data conveying the most important signals and remove those creating confusion? Also, how to estimate correctly the current economic situation and its short-term evolution with a multitude of data? One of the solutions is to implement an early warning system, i.e. a Decision-Making Support System.
3. The Decision-Making Support System analyses the data from various sources (not only statistical, but all relevant data), emphasizes their inter-correlation and interaction, and presents them as simply as possible. Such extracted and presented indicators make it easier to understand them and make decisions, offering at the same time alternatives in the process of management and macroeconomic decision-making. In this way, the statistical system gets an active and dynamic role in the macroeconomics, contrary to the conservative and passive approach, in which its function would come down to the production, processing and release of data.
4. The Statistical Office of the Republic of Serbia (SORS), as an official producer of statistics, publishes a large amount of releases, indicators, bulletins, etc. This multitude often confuses the users, who utilize the statistics to evaluate their performances and the extent to which they are aligned with other business subjects and developments. Considering that numerous users are statistically and economically illiterate, this diversity of data leads to confusion, incapacity to understand, erroneous assessment of priorities, and even to reluctance towards information. In the modern society, this is not uncommon because the statistical system is very complex, general and designed to meet the specific needs for information. Such ways of becoming informed are often not sufficient to decision-makers because they depict the macroeconomic situation only partially.
5. Given the often-present political influence on the decision-making process, which can lead to undesirable solutions, democratic society has the goal of performing decision-making process on the basis of recorded data to the greatest extent possible (i.e. evidence based). In this sense, statistics are a necessary information instrument, which can significantly contribute to the relevance, efficiency and effectiveness of the decision-making process. The integration of statistics into public policy is the essence of contemporary tendencies of today's society.
6. Political power, on the one hand, and knowledge and expertise on the other, should be complementary, not in conflict. Statistics today are becoming more and more utilized, not only useful. Ownership of data and information is not the exclusive right of statistics and even less decision-makers property – on the contrary, only the integration of these two sides can be a road to progress.

## **II. Tools of the Decision-Making Support System**

7. In January 2017 The Government of the Republic of Serbia founded the Council for the Coordination of Activities and Measures for the Growth of GDP, where SORS plays an important role, not only as data provider, but also as an active member of the analytical team. The main role of the Council is to develop analytical monitoring mechanism of GDP growth and to analyse the changes in trends of individual growth factors, as well as to ensure timely consideration of possible support growth measures.

8. Monitoring of the realization of projections and appropriate feedback on individual activities and macroeconomic domains begins each month with updating specially selected set of indicators and data on current developments, which provide picture about the direction (bad, neutral or good) of movement in certain activities.

Figure 1  
**Decision Making Support System**



9. Some of the DMS tools are:

(a) Projection updating system at monthly frequency

Projections can be observed from two perspectives: i) first, from the aspect of planning (where competent institutions – public enterprises and ministries hold the key role); and ii) second, from the aspect of statistical models, i.e. based on the movements of the trend-cycle component of time series.

Discrepancies between plans and statistical projections occur when ministries and other planned subjects observe the effects of certain measures on the gross value added (GVA), or due to the difference in the expressed factography (e.g. monitoring construction by SORS and ministries). Where the discrepancies are very pronounced, the causes thereof should be thoroughly examined.

Figure 2  
**GDP growth projections by sector (using the Statistical Classification of Economic Activities in the European Community (NACE rev.2))**

NACE Rev. 2 sectors		Real growth rate of GDP (2018/2017) based on SORS projections	Real growth rate of GDP (2018/2017) based on ministries' projections
A	Agriculture	12,8	6,1
B, C, D, E	Mining, Manufacturing, Electricity, gas, steam and air conditioning supply, Water supply	5,3	6,7
F	Construction	5,9	4,0
G, H, I	Retail and wholesale trade, Transport, Catering and Tourism	4,0	2,9
J	Informing and Communication	2,0	2,0
K	Finance and insurance	1,0	1,0
L, M, N, ...	All other sectors...	.....	.....
<b>GDP</b>		<b>3,8</b>	<b>3,5</b>

Different GDP values based on SORS vs ministries projections

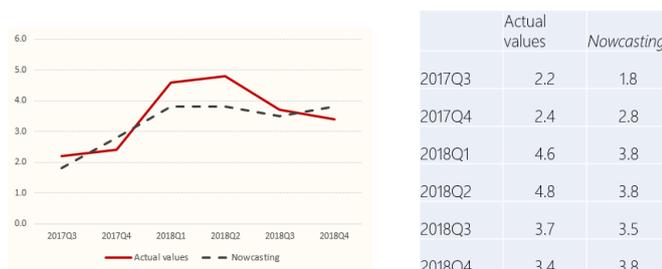
(b) Nowcasting of quarterly GDP

Nowcasting is the evaluation of a macroeconomic variable obtained during a reference period (in this case – a quarter). The idea of nowcasting is to use the signals of the movement of the targeted variable based on a heterogenous set of high-frequency information. Statistical

methods used for the calculation of nowcasting must not necessarily be the same as the ones used in the official calculation process. Their goal is to provide the most reliable evaluation of the referent variable. SORS uses Mixed Data Sampling (MIDAS) as methodological frame, which explains low-frequency variables as the function of high-frequency variables.

Figure 3  
**GDP – actual values and nowcasting**

• GDP – actual values and *nowcasting*



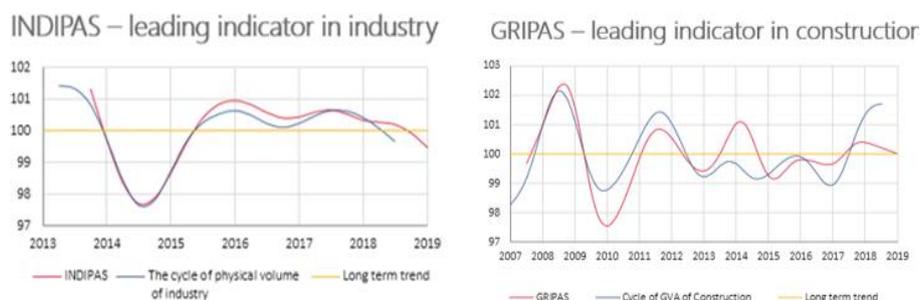
(c) Indicator of the monthly GDP (MK30)

MK 30 indicates the monthly trend of the total economic activity of the national economy. It is obtained as the weighted average of corresponding monthly indicators: industrial production, construction, wholesale and retail trade turnover, deposits and loans, telecommunication services, number of employees and agricultural production. MK30 is harmonized with the quarterly GDP trend using the benchmarking procedure, which preserves the monthly dynamics of the economic activity with the constraints imposed by the data on quarterly GDP.

(d) System of leading indicators

Leading indicators are used as analytical tool in predicting cyclical trends in economic activity. Includes detection of turning points, minimum and maximum, that would result in anticipation of the economic cycle of the domestic economy in the future. In the process of detection of the variables included in composite indicators, all macroeconomic areas and surveys on the expectations of economic entities in the Serbian economy were considered. The developed system of composite leading indicators leads ahead of the cycles of economic activity, on average, six months and, combined with econometric models, enables a quantitative evaluation of the dynamics of the annual growth rate of economic activity in the short term, at the quarterly and annual level.

Figure 4  
**Leading indicators in industry and in construction**



The Statistical Office of the Republic of Serbia uses forecast method based on ARIMA modelling processes for time series. ARIMA modelling method was developed by Box and Jenkins (1970), using known theoretical contributions of other authors. The main stages in modelling are: model identification, parameter evaluation, checking model adequacy and use of the model for forecasts. Each of these stages has its own specific problems, and the whole structure can also be modified. At monthly frequency, SORS makes

forecasts for the following macroeconomic domains: industrial production – total, manufacturing, consumer prices, retail trade turnover, exports and imports.

(e) Information on macroeconomic trends in the Republic of Serbia and quarterly publication *Trends*

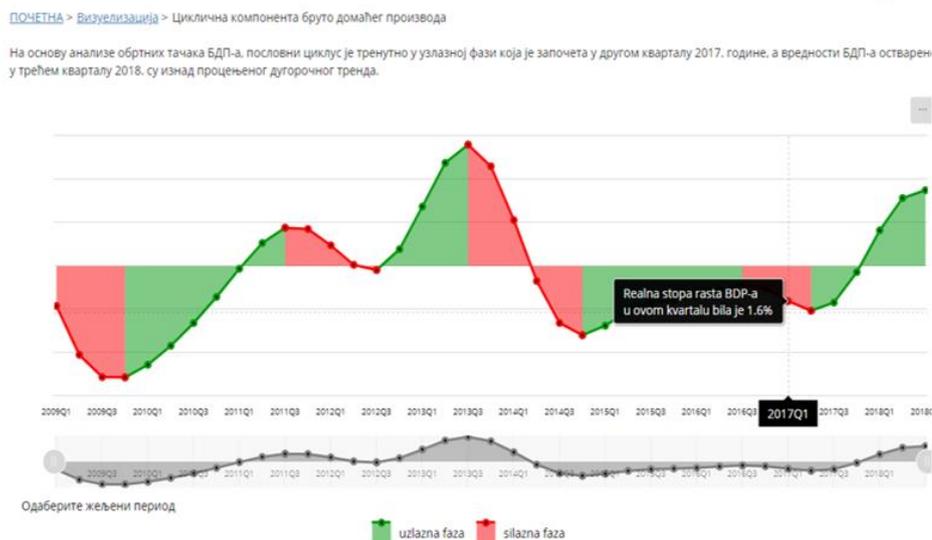
Monthly publication, combination of visual and numerical presentation with brief explanations of an occurrence and estimate of the developments of the occurrence, presented as meteorological signs. Information on macroeconomic developments aims to provide, in addition to a brief methodological explanation, both quantitative and qualitative developments of selected occurrences. *Trends* brings a series of novelties in addition to the conventional way of presenting the quarterly data – this is a new concept of displaying the most important economic signals through modern and advanced graphic solutions for presenting and disseminating a large set of statistics.

(f) Visualisation tools

For the purpose of achieving a quick insight into the position of the Serbian economy, without going into deeper analysis and without having the expertise knowledge, the SORS publishes monthly overview of GDP cyclical component as interactive graph on the SORS website.

Figure 5

### Example of visualization tools



## III. Cooperation with the Government

10. Numerous government bodies have recognized the importance of a complex connection between producers of official statistics, user needs and a wide range of current problems, which ultimately leads to an integrated approach to decision-making and policy-making. In line with this, the SORS has close cooperation with all of them.

11. At the beginning of each year, specially designed questionnaires are sent to ministries to be fulfilled with corresponding planned projections. They are asked to identify problematical or opportune activities, areas or projects where those activities have been detected, then select and define related measures or policies that have a chance, on the short-term or long-term, to be implemented and to encourage the growth of production and gross value added.

12. According to the presented measures, plans and activities for the succeeding year, ministry of finance and SORS prepare a couple of scenarios on potential GDP development. When scrutinizing the necessary measures or actions in removing the obstacles to growth or for supporting growth, the focus is on major warnings, analytically or directly detected, about specific macroeconomic domains, activities, potential possibilities of expansion or changes

in export performances. If, for instance, a certain trend is bad in an economic activity, but is proved indispensable after an additional survey, then support measures and actions do not need to be taken. If, following a supplementary examination of the issues of detected enterprises, activities or institutions, a certain measure or action proves to be possible in view of removing weaknesses or lack of efficiency, priority measures are to be defined. First, a feasible set of productive measures is tested, and then the most coherent ones are selected by means of an additional analysis and discourse.

13. Chamber of Commerce (CCS) has notable role in DMS. It collects information and data of general and special interest via branch associations and available data sources. The Department of Strategic Planning, Development and Analysis in CCS (under the authority of the president of CCS), whose professional capacities are supported by external experts, will deal primarily with an analysis dedicated to detecting problems and restricting them at micro level and levels of a homogenous group of producers and exporters. Introducing CCS in the system of planning, projections, detection of limitations and derivation of solutions allows rounding the depicted system of projections and monitoring of GDP growth, and the activity by economic activities. It also allows taking measures to support growth and remove restrictions. The Chamber of Commerce has developed a Decision-Making Support System at lower levels of business entities groupings, whether by territory or classification category, all through an individual business entity. This system is one of the analytical databases organized by different levels of data aggregation from various sources.

## IV. Conclusions

14. In SORS, the Decision-Making Support System was initiated in accordance with the capacities and capabilities. Realizing that the society with the centralized system of data (and information) production is slowly disappearing, SORS developed a close and lasting cooperation with other state institutions and bodies (ministries, chambers of commerce, working groups, etc.).

15. The entire work on the Decision Support System Project can be defined with several strategic objectives:

- Transform the institution into an extrovert knowledge and data producer, with the aim to help the process of common understanding of socio-economic phenomena
- Always have in mind the actual needs of the users, where the statistics should be visible and relevant in the process of public debate
- Statistical inputs in the decision-making process must have value added in terms of original, independent and reliable analyses, information, and the like
- Strictly adhere to the European Statistical Code of Practice by fostering professionalism to protect the reputation of the institution and its credibility.

16. In the process of establishing DMS, SORS received strong support from Eurostat, the only institution to which it is subordinated in terms of methodology and standards. Moreover, the European Statistical System, as it recognizes the increasing complexity of modern societies and the increased need for data integration, encourages national statistics to increase their impact through the introduction and improvement of analyses and reports they publish, as well as increasing the speed of response to user needs. In this way, official statistics are increasing the level of support they provide to the political system and thus contribute to the quality of the decision-making process.

17. In this regard, at the Conference of the Directors General of the National Statistical Institutes (DGINS) held in Lisbon in 2015, the Lisbon Memorandum was adopted as document, which emphasizes the importance of cooperation between decision-makers and data producers as the only way to ensure quality, reliable and a professional decision-making process.