The SORS Decision-Making Support System: A statistical tool for better policy making in the Republic of Serbia

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Abstract. Modern society is witnessing a data revolution which necessarily entails changes to the overall behavior of citizens, governments and companies. This is a big challenge and an opportunity for National Statistics Offices (NSOs). Especially after the outbreak of COVID-19, when the public debate about the number of mortalities and tested and infected persons escalated, trusted data is required more than ever. Which data can modern society trust? Are modern societies being subjected to opinion rather than fact? This paper introduces a new statistical tool to facilitate policy-making based on trusted statistics. Using economic indicators to illustrate implementation, the new statistical tool is shown to be a flexible instrument for analysis, monitoring and evaluation of the economic situation in the Republic of Serbia. By taking a role in public policy management, the tool can be used to transform the NSO's role in the statistical system into an active participant in public debate in contrast to the previous traditional, usually passive role of collecting, processing and publishing data. The tool supports the integration of statistics into public policies and connects the knowledge and expertise of official statisticians on one side with political decision makers on the other.

Keywords: Public policies, decision-making, post truth society, business cycle, evidence based decision-making, data for policy, data revolution, data stewardship, statistical literacy

1. Introduction: The need for evidence-based policy making in times of crisis and beyond

Nowadays decision-makers are faced with a large number of data which, absurdly, make decision-making processes more difficult. Decision making in current times is also in need for urgent decisions. The overload from excessive data and rapid changes calling for (almost) real-time data is typical for the modern society and raises the question how to extract data conveying the most important signals at the right time and remove those creating confusion?

Traditional key economic indicators such as GDP, the key growth indicator, are available on a quarterly and yearly basis and typically only published 60 days after the end of the reference period. This hinders the accurate estimation of the position of economy in a business cycle. On the other hand, the challenge arises, how to estimate correctly the economic situation and its short-term evolution with the current multitude of available data? One of the solutions as reflected by the Statistical Office of the Republic of Serbia (SORS) is to develop a Decision-Making Support System (DMSS) that accommodates an early warning system.

Such a DMSS collects and analyses data from various sources (not only statistical, but all relevant data), emphasizes their inter-correlations and interactions and presents them in the simplest way. The indicators derived and presented in the DMSS facilitate decision makers to understand economic reality and prepare de-

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cisions by offering alternatives in the process of macroeconomic governance and decision-making. In applying the principles of the DMSS, the statistical system gets an active and dynamic role in macroeconomics, contrary to the conservative and passive approach in which its function would come down to the production, processing and only straight-forward publishing of data.

In light of the current COVID-19 pandemic, the interest of researchers and analysts in the impact of the epidemic on the economic development is even larger then in 'normal' times: how much has been done to overcome the crisis, how was business reorganized, is the economic damage already evident, what are the immediate and near-term outlook, etc.? The socio economic and demographic impact of the crisis requires quick reactions. Anticipating the urgent need to assess the economic consequences and anticipate actions for the future aimed at measuring the impact of the pandemic, SORS has used the DMSS and introduced monthly surveys on the situation in construction, industrial production and trade industry, with the main goal to provide reliable information about short-term movements in these areas.

In this article the characteristics of the SORS DMSS are presented. The DMSS and its characteristics have to be seen in the context of the current situation with regard to availability and the use of statistical information. This context is relevant to the role of NSOs in managing the multitude of available data and the responsibilities NSOs and national statistical systems have to play. These background elements are discussed in Section 2. In Section 3 the characteristics of the DMSS are described. Sections 4, 5 and 6 list examples of the DMSS tools and their implementation on respectively, government level, local level and within the labour market. The paper concludes with a brief outlook.

2. Official statistics in the context of an overload of data and information

2.1. The rise of a post-truth society and crisis of truth

The overwhelming amount of information from a variety of official and non-official providers in combination with the urgent need for information for decision making creates a situation where the 'quality' of the information is under pressure. False news, misinformation and disinformation are circulating from social media to political party platforms and government. It seems that all data, news and statistics are distributed with a certain purpose and aim to generate required reaction or to benefit the owners of data. Rosenfeld [1] points out a recent English expression "that's my truth", which implies that people have lost out common ground about what is truth and what constitutes it, which can entail the existential crisis for democracy itself. In the circumstances of prevailing personal opinion over facts and various interpretations of data and facts, it seems that citizens have become alienated from political and civil institutions, and trust in institutions seems to have been permanently lost. As a typical example we can take the financial crisis from 2008 – amongst a data deluge, nobody saw and predicted the most severe crisis in the last fifty years and this lack of seeing and predicting undermined credibility in institutions and decision-makers [2–4].

The Oxford Dictionary Word of the Year 2016 was *post-truth*. It is explained as "an adjective defined as relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief" [5]. *Post – truth* was chosen as a word that reflects "ethos, mood or preoccupations of that particular year and to have lasting potential as a word of cultural significance political and social discourse" [6], as well as the word which dominated by highly-charged political and social discourse in 2016. Therefore, while every epoch has its own specific characteristics and challenges, our epoch is faced with lots of information from diverse media mixed with personal beliefs that altogether make life more stressful and complicated instead of making it easier. To summarize the characteristics of our epoch, we can say that we can encounter many questions and assumptions everywhere, but no answers.

Indeed, in today's socio – political environment, loaded with the multitude of data and sources of all kinds of information, dominant are the phenomena such as conspiracy theories, ill-information, 'fake news' stories, 'clickbait' etc. [7]. This is a time of political rhetoric, liberal social – economic paradigm, "freedom of the media". Modern society is faced with "hearing everyone's opinion", from unprofessional journalists to politicians who lust for power. They are allowed to judge the accuracy and correctness of official statistics, regardless of their incompetence and lack of professional knowledge. These tendencies clearly undermine an NSO's credibility in public just because someone has the right to say whatever he or she thinks.

Consequently, modern societies are experiencing an atmosphere of confusion and mistrust, and a mistrust

on information from governments, institutions, politicians, and media. People become increasingly suspicious, skeptical and full of anger and resentment over the information they are given, constantly looking for a culprit to be blamed. "Citizen's growing suspicion vis-à-vis the official statistics ... is in line with our 'post-truth' and anti-intellectualist era" [8]. According to some authors, rather than diffusing controversy and polarization in society, statistics are stoking them. Antipathy to (state) statistics has become one of the hallmarks of the populist right [9].

For societies this creates the need to choose an approach for supporting decision-making that allows to create clarity in this overload of data and opinions. This choice ranges between two extremes:

- based on the ambiguous attitudes of individuals, ideological starting points, selective information, prejudices and speculative assumptions – so-called *opinion based decision-making process*;
- based on relevant facts produced by well-informed professionals, independent and professional in the field of their competencies – so-called *evidence based decision-making process*.

2.2. *The precious opportunity of official statistics*

It is within this context that official statistics have a precious opportunity to stand out as an objective and independent institution that produces information based on established methodologies, using tested, approved and supervised methods and calculations. This scientific approach is based on facts that can be tested and proven. Generating and using evidence to inform government is not a partisan issue – it requires complex strategy [10]. Professional communities are prominently insisting on evidence-based decision-making as the only functional and ethical response to the challenges that the modern society is faced with. And official statistics, during its long history, gained skills and potential to provide users with high-quality and reliable information.

Political power, transmitted through government ministries, along with the knowledge and expertise concentrated in professional institutions such as statistical offices, should work together, avoiding collisions. The ownership of data and information is not an exclusive right of statistical institutes; however, statistical institutes are not expected to be passive producers, deprived of the right to express its own opinion regarding the observed phenomena and tendencies in the current environment. Also, data and information are not the property of decision-makers and politicians; on the contrary

– only joint work and cooperation between these two sides can be fruitful and enable the synergic process of maximizing the use of information for the purpose of quality decision-making and governance.

The huge amounts of data produced and disseminated every second take a risk of misuse, misunderstanding and manipulation. Whether true or false, they reach the public and transform themselves into a powerful tool that can be used (and misused) by politicians, interest groups and individuals, as the weapon of soft power for achieving certain goals. However, data around us are not self – explanatory; they need to be digested, processed and transformed into meaningful and useful information. For information to be used for official national or regional policy making this is supposed to be a role of official statisticians, having in mind their capacity and historical background to be regarded as the most engaged part in the process of keeping pace with the changing world in the domain of producing data and information.

However, in most countries the role of official statistics is still mostly limited to the traditional tasks: collecting, processing and dissemination of data, avoiding interpretations and explanations, let alone sharing opinion about trends in various phenomena. "Keeping objectivity" and absence of aspiration to influence public opinion is most often mentioned by statisticians as the reasons and explanations of this rigidity. However, does "keeping objectivity" imply *intellectual passivity* [11]?[1] Does the desire to be a professional, in the traditional sense, imply staying apart and being neutral?

2.3. *A responsibility in processing the data but also in communicating the information*

Policy-makers' capacity to understand data, to make distinction between unprocessed "raw" data and extracted information and to observe the interconnectivity among them, is often limited and their ability to use data might lag behind the pace of the changing world. In many cases, due to the nature of their work, it is not easy to recognize the real value and preciousness of the available data due to the lack of time, since the process of policy-making requires relatively quick re-

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[1] Intellectual passivity used in this context is the term originating from the speech of Ted Porter, Distinguished Professor of History (UCLA), delivered at the conference *Power from Statistics: delivering the evidence of tomorrow*, held in Brussels 18–19 October 2017. For more information see: https://ec.europa.eu/eurostat/cros/powerfromstatistics/home.html.

actions and the space for reaction is isolated and narrowed [12]. The challenge remains as how to define the policies in accordance with the respective information and how to bridge the gap between data and policymaking.

Moreover, among politicians a strong pressure is felt to keep the status quo in institutional life, with suspicion to innovation in the sense of reorganizations, changing traditional roles and overleaping responsibilities between institutions [13]. The rigidity of state administration is widely present and also well-known through all stages of state development. Furthermore, there is often (at least a subtle) attempt to impose political influence on the decision-making process, which can lead to undesirable solutions, rent-seeking behavior and opt for expensive and unprofitable projects. However, "people want government that solve problems" [10]. Given that, any democratic society should have the goal to perform the decision-making process on the basis of recorded data to the full extent (i.e. evidence-based decision-making). In that process, official statistics should be a necessary information-generating instrument which can significantly contribute to the relevance, efficiency and effectiveness of the decision-making process. To strengthen and regain trust in institutions and official statistics, NSOs more than ever need to adopt a pro-active role and to broaden their focus to the issues concerning everyday life. In our opinion in the current times this pro-active role has four elements.

The important first element is to make policy-makers aware of the value of information around them and to open debate with them about the proliferation of information in the modern world and the lack of quality and relevant data at the same time. Promoting data literacy, insisting on expertise and professionalism, favoring and emphasizing the advances and qualities of official statistics are other necessary steps in the process of shifting the role of the NSO and promoting it as an institution capable of providing decision-makers with high quality information.

The second element of this pro-active role is that official statistical institutes must also assure themselves that user communities recognize their relevance for understanding world around them or for informing decision made by themselves or others [14]. It means that in most cases they must work more on statistical promotion and dissemination, but also on updating statistical laws, modernizing statistical standards, introducing new technologies and data sources into their activities, and most importantly, improving data and statistical

literacy in its users. In a time of lack of trust in government institutions coupled with the opportunity for data to impact and transform every part of governance, more flexible and open-minded models to correctly respond to the challenges of our era is an initiative that should be considered with the greatest attention. "Is statistical evidence used to stimulate political dialogue (opening up), to shorten it, or, in the worst case, to suppress it (closing down)? Depending on how these questions are answered, statistics will win or lose citizens' trust [15]".

The third element of the proactive role is related the challenges on authority and the leadership role of governments and statistical offices in the context of the new data ecosystem that provides many opportunities and enables more effective use of official statistics [16]. In such environment NSOs can assist public administrations as 'data stewards' and contribute with their expertise in data management, data governance and the generation of information derived from a variety of data. This is an opportunity to strengthen the role of NSOs and official statistics in the public domain [17]. The impact of data could be improved with combining separate datasets from different sources.

A fourth element of the proactive role goes even one step further outside the traditional role of official statistics organizations. A role that goes beyond being a steward managing data to facilitate coordination and collaboration between institutions that provide different data and ensure responsible, accountable data sharing in the public interest. This is the position of active contributor to trusted debate and decision-making.

3. The DMSS as a main tool for SORS to assist in the national decision-making process

3.1. The Serbian statistical system

Serbia's political decision-making structure is centralized around the Prime Minister with a variety of bodies connected to the Prime Ministers office. However, the communication between the connected bodies and institutions is limited. In such a structure, policy functions suffer from the lack of expert knowledge and without synergistic governance. The absence of coherence could be bridged by applying an integrated approach to cooperation between politics, politicians, decision-makers and experts since all of them represent different pieces of a policy-making process. The right balance of these "components" implies the division of

roles among all parts and at the same time awareness that expertise cannot be separated from politics and policy making, and that professionals give specific value added to decision-making processes. In this way only the policy process could be made coherent, comprehensive and in touch with the needs of real world and real people. Or, in other words, we need to bring the policy process closer to the real world and bring the real world closer to the policy process [13].

For this reason the Government of the Republic of Serbia established in 2017 the *Council for the coordination of activities and measures for the growth of GDP*. The main role of the Council is to develop analytical and monitoring mechanism of GDP growth and to analyze the changes in trends of individual growth factors, with the aim to ensure timely consideration of possible growth support measures. The Council's members are representatives of the government ministries, the Serbian Chamber of Commerce and SORS, which has a significant role not only as data producer, but also as an active member of the analytical team. At the very beginning of a month, the members of the Council gather to discuss and evaluate current economic situation based on the SORS analytical models and the latest information about each area of economy, completed with the ministries' reports, the Chamber of Commerce information and the reports from public enterprises (such as Electric power industry of the Republic of Serbia that is responsible for the supply of electricity).

Specially designed questionnaires made by the Council staff are sent to government ministries to be completed with the corresponding planned projections. They are asked to identify problematic or opportune activities and areas or projects where those activities were detected. Afterwards, Council staff propose the relevant short-term or long-term measures or policies that could be implemented to spur the growth of production and gross value added.

3.2. The DMSS as a specific tool within SORS

SORS, as an official producer of statistics, publishes a large amount of releases, indicators, bulletins etc., Users in the modern society 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 and without adequate capacity to understand statistical methodologies and data, the diversity of data can lead to confusion, wrong con-

clusions, erroneous assessment of priorities, and even to reluctance towards information. Also, the statistical system is very complex, generalized and designed to meet the specific needs for information (e.g. agriculture, prices, manufacturing, etc.). The information provided is often not sufficient to decision-makers, because the macroeconomic environment is often only partially described.

As mentioned by Radermacher [15], the handy and popular formulation "Data for Policy" (D4P) covers numerous topics such as modernization of the public sector, evidence-informed policy making, new solutions, new technologies and indefinitely rich data sources. However, this raw material of data is not directly usable in politics – the statistical system needs to distill, refine and process valuable statistical knowledge from the flood of raw data into digestible information for politics. Hence, the purpose of the statistical system is also to find relevant, but often hidden or unnoticeable relations between different indicators, to extract key information from a large number of data and to define key indicators with the aim of augmenting the efficiency and reliability of the decision-making process.

In order to provide the users with sufficient, useful and reliable information to identify the situation in the economy including potential imbalances, risks to stability and their possible prevention, SORS has created a department dedicated to catalyzing pieces of information and transforming them into simple, reliable and widely usable indicators and accommodate SORS to fulfill the four proactive roles as sketched above.

To support the satisfactory fulfilling of the roles, SORS has also developed a Decision-making Support System (DMSS).[2] The DMSS is designed as a set of tools essential for better understanding the economic position of a country, and therefore to facilitate a high-quality decision-making process. With this system SORS expands its main role from passive to active player in decision-making processes, from an institution responsible only for publishing sets of various data to a modern pro-active institution which provides explanations, offers alternatives, searches for interconnections in the economic environment and places them in order to facilitate complex process of decision-making.

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[2]Similar systems have been developed by other countries. For example Italy [18], France [19] and on European level by Eurostat [20], the Statistical office of the European Union.

3.3. Main characteristics of the DMSS[3],[4]

The DMSS is designed as a set of tools, some already a regular part of the official statistical system and some subsequently introduced and designed to better illustrate and explain a particular phenomenon. These tools aim to statistically clarify the interaction between key economic indicators, to explain the economic position of the country and facilitate high-quality decision-making processes. Examples of these tools are a monthly projection updating system, a system of leading indicators, a system for quarterly GDP nowcasting, forecasts and a system of Economic Sentiment Indicators (ESI).

In common synergy, these tools can provide a multidimensional explanation of a phenomenon.

Many of the tools already a regular part of the official statistical system were, before DMSS, strictly related to only one statistical area (e.g. ESI was always published separately instead of being analyzed in interaction with other statistical indicators) and were never analyzed together with industrial production, tourism activity, etc. nor in the context of a broader picture composed of other economic indicators.

The DMSS has a three parts:

– DMSS for *government level*, consisting of information and indicators necessary for decision-makers at the highest level of government. These are macroeconomic indicators such as GDP and its components.

– DMSS for *local level*, covers indicators useful for local level of government. These indicators are produced in regional statistical centers and are based on monthly surveys aimed to provide information of movements in industry, construction and trade, one month before official results are published.
– Labour Market Intelligence System, (LMIS) that aims to provide information on labour market trends necessary for better anticipation and matching of labour market supply and demand.

In Sections 4, 5 and 6 these three parts will be illustrated with specify examples of the DMSS tools.

In running the DMSS, there is cooperation between several actors. The role of SORS is to collect, process and analyze data with an emphasis on finding and highlighting traductive links between phenomena; the Chamber of Commerce of the Republic of Serbia (CCS) collects information and data of special interest via branch associations; the Department of Strategic Planning, Development and Analysis deals primarily with an analysis dedicated to the detection of issues and restricting them at micro level and levels of a homogenous group of producers and exporters. CCS has developed a Decision-Making Support System at lower levels of business (level of enterprises and business branches), whether by territory or classification category; experts from the other competent ministries evaluate projections based on the information they have; representatives of public companies present the problems and challenges they face, such as orders, sales, delivery etc. All actors together discuss short-term trends in the Serbian economy and consider possible measures to support economic growth.

The main output of the DMSS are specific statistics. Four categories can be distinguished:

– Forecasts – predictions of the macroeconomic variables, made *before the period of interest begins*. Forecasts are based on current and past values as an expectation (prediction) of what will happen.
– Projections – indicate what future level of the macroeconomic aggregate would be if the set of underlying assumptions was to occur.
– Nowcasts – predictions of the macroeconomic variables made during the relevant period (for instance a quarter).
– Flash estimates – estimates of the macroeconomic variables made immediately or shortly after the period ends when disaggregate information remains incomplete.

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[3]The DMSS Project aimed to create a well functioning support system to decision making, but beyond that was also responding to several other 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 information
– strictly adhere to the European Statistical Code of Practice by fostering professionalism to protect the reputation of the institution and its credibility.

[4]In the process of establishing the DMSS, SORS received strong support from Eurostat. Moreover, the European Statistical System encourages national statistics to strengthen their impact through the introduction and improvement of the analyses and reports they publish, and also facilitates the response to user needs. The Annual General Directorate of National Statistics – DGINS – Directors of National Statistical Institutes, held in Lisbon in 2015, adopted the Lisbon Memorandum [21] emphasizing the importance of cooperation between decision-makers and data producers as the only way to ensure quality, reliable and a professional decision-making process.

4. DMSS tools for government level

4.1. Monthly projection updating system

Projections indicate the level of an aggregate in future provided that a set of defined assumptions is realized. In the scope of the DMSS, the projection system has two aspects:

1. planning: where respective institutions (public enterprises and government ministries) hold the key role and according to their plans and information, anticipate the trends for the next year. They are obligated to complete specially designed questionnaires with the required information about production, stocks, orders and issues they expect to have in the forthcoming period and deliver them to the Council, together with the estimated projection for the period ahead.
2. statistical models: i.e. based on the movements of the trend-cycle component of time series, ARIMA forecasting, leading indicators, etc. The SORS provides these projections and estimate their impact for example, on GDP.

The discrepancies between the planning and statistical model based projections occur because the government ministries and other subjects observe the effects of *certain measures* (i.e. their quantitative impact) on the GVA, or due to the difference in the expressed factography (e.g. for monitoring construction works, SORS and the respective ministry use different methodologies). Where the discrepancies are rather expressive, the causes thereof should be thoroughly examined and discussed with the aim to provide as much as possible accurate estimations for the coming year.

4.2. System of composite leading indicators

Leading indicators are used as analytical tool in predicting cyclical trends of economic activity. It includes detection of turning points, minimum and maximum that could result in anticipation of an economic cycle of the domestic economy in the future.

In the process of detection of the variables to be included in composite indicators, all macroeconomic areas and surveys on the expectations from the Serbian economic subjects were considered. The developed system of composite leading indicators leads ahead of the cycles of economic activity by six months on average and, combined with econometric models, enables a quantitative evaluation of the dynamics of the an-

nual growth rate of economic activity on short term, quarterly and annual basis.

SORS produces the leading indicators for agriculture, industry, construction, trade, and services. The database formed for the calculation of leading indicators includes more than 3000 variables (monthly updated); however only variables with the best leading performance are included in the final composition of the composite indicators. Together with projections, forecasts and nowcasting, the leading indicators more clearly explain the movement of the most important macroeconomic indicators and GDP.

4.3. Nowcasting quarterly GDP

Nowcasting is the evaluation of a macroeconomic variable obtained during a reference period and it is based on partial and indirect information about the targeted variable (in this case – a quarter). Nowcasting is fact – based, focused on the known and knowable, and therefore avoids forecasting.

The idea of nowcasting is to use the signals of the movement of the targeted variable based on a heterogeneous set of higher frequency information. According to Eurostat's Handbook on Rapid Estimates [22] Statistical methods used in the nowcasting context do not necessarily replicate those used in the regular compilation process, they mainly aim to produce the most reliable results for the reference variable, that is the best estimate of the evolution of the reference variable.

Therefore, available data for the second month of the referent quarter is used for nowcasting of the quarterly GDP. Then, one month later, having data for the whole quarter, the flash estimation of GDP is being calculated. And finally, next month follows the regular estimation of quarterly GDP. For the nowcasting SORS uses MIDAS methodology [23] (Mixed Data Sampling as methodological frame) which explains low-frequency variables (GDP) as the function of high-frequency variables (monthly indicators on industry, prices, trade etc.).

4.4. Indicator of the monthly GDP

This indicator reflects the monthly trend of the total economic activity (i.e. GDP) of the national economy. It is created and developed in SORS as synthetic macroeconomic indicator that should serve as the base for medium-term forecasts and estimate of monthly GDP. MK30 is obtained as the weighted average of corresponding monthly indicators: industrial production, construction, wholesale and retail trade turnover, de-

posits and loans, telecommunication services, number of employees and agricultural production.

The indicator is harmonized with the quarterly GDP trend using a benchmarking procedure which preserves the monthly dynamics of the economic activity with the constraints imposed by the data on quarterly GDP. Based on the movement of this indicator, it is easier for decision makers and other analysts to predict the GDP growth in in the coming quarter.

4.5. Forecasts of major macroeconomic domains

SORS uses a forecast method based on time series ARIMA modeling processes developed by Box and Jenkins (1970) [24] to produce forecasts for major macroeconomic domains. The main stages in the modeling are: model identification, parameter evaluation, checking model adequacy and the use of the model for forecasts. Each of these stages has its own specific problems, and the whole structure can also be modified. On monthly basis, SORS makes forecasts for the following macroeconomic domains: Industrial production – total, Manufacturing, Consumer prices, Retail trade turnover, Exports and imports.

4.6. Description of developments for major GDP components

SORS prepares short descriptions about the current evolution of selected areas and sectors (industry, experts, prices, construction, etc.) which include the most important details related to a particular sector. These sectors are highly correlated with the development of the economic cycle, being therefore often used as predictors of the movements of the whole economy. E.g. industrial production, with a share of about 20% in GDP, has an important contribution in the Serbian economy andanalysis of trends includes the evaluation of the dynamics of the trends in the sections B – Manufacturing, C – Gas, steam and air conditioning supply, and D – Mining and quarrying, according to the Classification of Activities, 2010/NACE Rev 2, as well as in their major divisions with the highest shares in the formation of the Industrial Production Index. The brief information also considers enterprises that have low performances which contributeto falls in certain divisions. The descriptions are aimed at estimating the current evolutions of components such as the trend-cycle and seasonally adjusted indices. Based on the behavior of these components, the conclusion may be drawn about the (short-term) future trend, allowing thus the ex-post and ante-post valida-

tion of coincidental (current) trends, early detection of imbalances and key macroeconomic signals, as well as getting a global view of the whole sector, from all available aspects.

4.7. Flash estimates – Economic Sentiment Indicator

The purpose of the composite Economic Sentiment Indicator (ESI) is to present producers' and consumers' perceptions about economic movements and economic stability. This indicator is used to assess the economic situation, make flash estimates, for scientific and analytical purpose, as well as for international comparisons. Therefore, economic agents' expectations are indicative of the changes in economic movements, which contribute considerably to creating economic policies.

ESI has been developed by the General Directorate for Economic and Financial Affairs of the European Commission [25]. It is obtained through five different surveys of producers and consumers whose perceptions or expectations provide a reliable indication of economic movements, based on which confidence indicators are created. Confidence indicators of the analyzed sections are weighted in order to reflect their influence on economic activity: manufacturing −40%, service activities −30%, household consumption −20%, construction −5% and retail trade −5%. A value of ESI index exceeding 100 indicates improvement or economic activity, while that below 100 suggests decline.[5]

4.8. Information on macroeconomic trends

The information on macroeconomic trends in the Republic of Serbia is a monthly dashboard/scoreboard-style publication that includes a selected set of indicators. Each indicator is accompanied by its visual presentation (graphs, maps, etc.) with brief explanations and estimation of the development presented as meteo signs. The information on macroeconomic developments is aimed at providing both quantitative and qualitative developments of the selected set of key indicators (employment, wages, public finances etc.).

SORS quarterly publication *Trends* uses advanced graphic solutions for presenting and disseminating a large set of statistics for displaying the most important economic signals.

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[5] More on the methodology: https://ec.europa.eu/info/sites/info/files/bcs_user_guide_en_0.pdf.

4.9. Visualization tools

For the purpose of achieving a quick insight into the position of the Serbian economy, without having to go into a deeper analysis or requiring expert knowledge, SORS publishes a monthly overview of the GDP cyclical component (and a couple of other indicators such as the age pyramid of the population) as an interactive graph on the SORS website, as well as many infographics (external trade, industrial production, construction, employment, wages).[6]

5. DMSS tools for local level (DMSS LL)

The essence of DMSS LL is the coordination of all official statistical resources in providing support to decision-makers at the local level. The cooperation of SORS with various business associations, local governments and public enterprises is the best way to determine the needs of users of statistics at all levels, the government and the local communities. The benefits of this cooperation are multiple, for SORS and for data users. Some of them are the following:

– acquisition and processing of data that provide answers to the most important issues at the local level,
– constant monitoring of the needs of local communities,
– increased expertise of the SORS staff,
– strengthening and promotion of statistics,
– active role in strengthening the interaction with data providers,
– paved new path in returning processed data to their providers, which is in fact the general goal of data collection,
– defined the new role of SORS as a strategic partner in data analysis.

For DMSS support at the local level (DMSS LL), SORS intends to promote its innovative stance on the necessity of the system for the analysis of all available data for decision-making process at the local level.

6. The Labour Market Intelligence System (LMIS)

A special and specific part of DMSS is a Labour Market Intelligence System (LMIS). The founding of

this system is generated by the fact that the Republic of Serbia has lately been facing a widening gap between labour market supply and demand. Since it is a serious obstacle to foreign direct investments and further acceleration of economic growth, a need for better understanding of labour market demands and skills matching has recently been highly positioned on policy agenda. The reasons for this gap are the emigration of highly qualified population, negative natural population growth, technological revolution, global economic trends, limited labour mobility, underinvestment in staff training by employers, obsolescence of knowledge and skills caused by the extended period of economic transition.

With the aim to provide relevant information on labour market trends in a user-friendly form, which enables better anticipation and matching of labour market supply and demand, SORS initiated in 2019 together with relevant stakeholders the development of the Labour Market Intelligence System, as a new component of Decision-Making Support System.

LMIS is designed as a real-time web platform that brings together all available labour market related data. The data from Central Register of Social Contributions Payers, Tax Administration, National Employment Service, Ministry of Interior, Central Job Vacancies Register, Statistical Business Register, Labour Force Survey, education statistics, demographic statistics, enterprise statistics and other relevant sources are integrated into one comprehensive database and disseminated in a timely fashion, enabling comparison of data over time and geography. Quantitative information will be accompanied by qualitative data that explain the context and add value to the numbers. In the coming period, this system will be supplemented by data from the Unified Education Information System (UEIS), as soon as it is established (in March 2021).

The four objectives of the LMIS are

– to help education and labour market policy-makers to decide on the transformation and further development of education and training systems in order to adapt to the rapidly changing labour market requirements and conditions,
– to help training institutions to make decisions on the type and content of training courses to be delivered,
– to provide information on labour market demands to the individuals helping them to make decisions regarding their education and training, aimed at developing and matching their skills to the labour market needs and rapidly changing workplaces,

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[6]Available at: https://www.stat.gov.rs/en-US/vizuelizacija/interaktivni-grafikoni.

– to provide information to the employers on the current labour supply and forecast labour market trends and help them to take decisions on how to train workers and use their skills.

The development of LMIS is a continuous process. Even though SORS provides technical solutions and coordinates activities around its development, the effectiveness of that tool depends strongly on the quality of administrative and statistical data integrated in the system, as well as on the support from the relevant institutions and the Government.

7. Conclusions and outlook

DMSS was initiated by SORS in accordance with the available capacities and capabilities which are modest and limited. Since being aware that the society in which the system of centralized production of data (and information) is short of breath, SORS developed close and permanent cooperation with other state institutions and bodies (ministries, chambers of commerce, working groups, etc.). Therefore, in the decision-making process there is now interaction between analysts, statisticians and decision-makers, where official statistics have the role of not only informers, but also of active participants in the process of public policy management.

In the forthcoming period SORS anticipates the continued development of DMSS LL in the way that integrates all available statistics and all levels of statistical expertise together, as a response to the increasing needs of local communities. To attract as many respondents as possible to participate in surveys, SORS is working on creating a closed web portal with visualization tools for data analysis at local level. This is supposed to be a token of SORS' gratitude to survey participants and at the same time a kind of support to local communities and promotion of sharing ideas and innovative roles of official statistics.

The COVID-19 outbreak expressively indicated the need to maintain various communication channels with reporting units as our valuable source of data. At the same time official statistics must be able to quickly respond to unpredictable circumstances; the best way to do so is to initiate new and promptly implemented statistical series that can help us to better anticipate and react in these situations.

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