

AN OUTLINE OF INNOVATION IN OFFICIAL STATISTICS

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- Innovation is a concept that has become commonplace:
 - Is used in the media advertising various products placed on the market,
 - there are various scientific surveys and research works on this subject, covering various fields.
 - It comes from the Latin word “*innovatio*”, which means renewal.
 - The term "*innovation*" can include everything that is new, i.e.:
 - technical, technological and organizational changes,
 - changes in management systems,
 - interpersonal communication in the world of media, fashion, as well as in ways of thinking.
- The term was intended to be defined and introduced into economics by Schumpeter (1912), thus indicating five instances of occurrence of innovations:
 - Creating a new product;
 - Application of new technology, production methods;
 - Creating a new market;
 - Acquiring unknown raw materials;
 - Reorganization of a specific branch of the economy.

HOW TO MEASURE, COLLECT, PRESENT, ANALYZE AND INTERPRET DATA ON INNOVATION

- ❑ To measure of scientific, technological and innovation activities, to collect, report and correctly using data on innovation, special manual has been prepared:

“Oslo Manual”.

- ❑ Since 1992, the „*Oslo Manual*” is an international standard in the field of conceptualization and measurement of innovation.
- ❑ Since then, it has been verified three times to take into account the growing current level of development and the changing needs of users.
- ❑ It aims to facilitate international comparisons and provides a platform for research and experiments in measuring innovation.

OECD/Eurostat (2018), *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition*, The Measurement of Scientific, Technological and Innovation Activities, OECD .Publishing, Paris/Eurostat, Luxembourg, <https://doi.org/10.1787/9789264304604-en>.

THE GENERAL DEFINITION OF AN INNOVATION

“An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit’s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)”.

- Although the concept of innovation is inherently subjective, its application is rendered fairly objective and comparable by applying common reference points for novelty and utility, requiring a significant difference to be appreciated.
- This facilitates the collection and reporting of comparable data on innovation and related activities for firms in different countries and industries and for firms of different sizes and structures, ranging from small single-product firms to large multinational firms that produce a wide range of goods or services.

OECD/Eurostat (2018), *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation*, 4th Edition; (<https://doi.org/10.1787/9789264304604-en>)

EUROSTAT AND OECD RESEARCH ON INNOVATIVENESS

The innovation research problem:

- ❖ **The research problem should be the explanation and description of the regularities that govern the interactions within its framework,**
- ❖ **which consist of coordination, communication, decision making,**
- ❖ **which transforms resources into products.**
- ❖ **Therefore, OECD and Eurostat research on innovativeness on a larger scale in enterprises in various industries as well as in services has been undertaken.**

Innovative surveys:

- **Innovative surveys are carried out every two years across the European Union, some EFTA countries and EU candidate countries,**
- **focuses mainly on innovative activities in industry and services.**

European statistics on the results of innovation are a tool for assessing innovative results in EU Member States and underline the relative strengths and weaknesses of their innovation systems.

INNOVATIONS IN STATISTICS

Innovations can also be observed in statistics:

- in the form of introducing various solutions that improve:**
 - **the work of an institution or office,**
 - **organization of statistical surveys,**
 - **methods of data collection,**
 - **methods of their elaboration,**
 - **analysis,**
 - **accessibility,**
 - **presentation,**
 - **dissemination and**
 - **publication.**
- Innovation in the area of statistical processes:**
 - **is a new or improved statistical process for one or more statistical functions, which differs significantly from the previous statistical processes of the company and was put into use by the company**

OFFICIAL STATISTICS

Official Statistics:

- Professional Independence
- Mandate for Data Collection
- Commitment to Quality
- Impartiality and Objectivity
- Sound Methodology
- Non-excessive Burden on respondents
- Timeliness and Punctuality

Data for Official Statistics:

- Generated by digital and survey data sources
- Often not generated primarily for the statistical purposes
- Statistical modelling will be a main activity

POSSIBLE BENEFITS AND CHALLENGES OF BIG DATA FOR OFFICIAL STATISTICS

Possible benefits of Big Data for Official Statistics:

- **Faster results**
- **Lower cost**
- **Higher precision - For small groups like a freelancer at the country side
- For small areas like the next street behind the corner**
- **Completeness**
- **Less burden for the respondents**

Challenges of Big Data for Official Statistics:

- **Quality issues**
- **Privacy and legal constraints**
- **Permanent access to the data**
- **Competition at the information market**
- **Competition for the best brains**

BIG DATA AND OFFICIAL STATISTICS

Big Data UN Global Working Group

Big Data UN Global Working Group:

- members: countries and international organisations (OECD, Eurostat, World Bank)**
- different task teams**
- 'Big Data project inventory' UN Economic Commission for Europe (UNECE)**
- Big Data projects on partnerships, quality, skills**
- 'Big Data Inventory': open access online platform with detailed information about Big Data projects .**

A dissemination strategy based on open data does put the Official Statistics users at the centre:

- **Reaching them through different channels, e.g. apps and social media**
- **Making easier for them to retrieve data, e.g. federated query that make transparent the distribution of data on different portals**
- **Providing better services to them, e.g. spatial querying and dynamical visualizations**

EUROPEAN STATISTICAL SYSTEM (ESS)

SCHEVENINGEN MEMORANDUM, 2013

Innovation of Big Data:

- The European Statistical System (ESS) has committed itself to exploring the potential of big data for producing official statistics by adopting the Scheveningen Memorandum (*ESSC, 2013*) in 2013 and the Big Data Action Plan and Roadmap (*ESSC, 2014*) in 2014.
https://ec.europa.eu/eurostat/cros/content/ess-big-data-action-plan-and-roadmap-10_en
- The European Statistical System (ESS) Big Data Action Plan and Roadmap 1.0 was elaborated by a Task Force composed of representatives of national statistical offices, the OECD , the UNECE , DG CONNECT, the JRC and academic experts. It is the response to the [Scheveningen Memorandum](#) that called for the adoption of an ESS action plan and roadmap by mid 2014.

OFFICIAL STATISTICS AND BIG DATA

<https://unstats.un.org/bigdata/>

- ❖ For national statistical offices, traditional strengths include, on the one hand, the ability to collect data and combine data sources with statistical products and, on the other hand, their focus on quality, transparency and sound methodology.
- ❖ In the Big Data era of competing and multiplying data sources, they continue to have a unique knowledge of official statistical production methods.
- ❖ In time, this may lead to a shift in the role of statistical institutes in the provision of high-quality and impartial statistical information to society.
- ❖ National statistical offices and universities :
 - Educating the next generation of statisticians
 - Improving the curriculum by including more aspects of new digital sources also in introductory courses
 - Improving the statistical literacy for the data user side

OFFICIAL STATISTICS AND BIG DATA (CONT.)

Beręsewicz, M., R. Lehtonen, F. Reis, L. Di Consiglio, and M. Karlberg (2018), An overview of methods for treating selectivity in big data sources.

The paper (Beręsewicz et al. 2018) presents a statistical approach to big data:

- **Searching for a definition meaningful from the statistical point of view and identifying its main statistical characteristics.**
- **It then argues that big data sources share many characteristics with Internet opt-in panel surveys and proposes this as a reference to address selectivity and coverage problems in big data.**
- **Coverage and the self-selection process are briefly discussed in mobile network data, Twitter, Google Trends and Wikipedia page views data.**
- **An overview of methods which can be used to address selectivity and eliminate, or mitigate, bias is then presented, covering both methods applied at individual level, i.e. at the level of the statistical unit, and at domain level, i.e. at the level of the produced statistics.**
- **Finally, the applicability of the methods to the several big data sources is briefly discussed and a framework for adjusting selectivity in big data is proposed.**

THE UNITED NATIONS GLOBAL WORKING GROUP (GWG) ON BIG DATA FOR OFFICIAL STATISTICS

[5th International Conference on Big Data for Official Statistics](#)

29 April - 3 May 2019, Kigali, Rwanda // [EVENT PAGE](#)

<https://unstats.un.org/bigdata/>

- **The United Nations Global Working Group (GWG) on Big Data for Official Statistics was created under the UN Statistical Commission in 2014.**
- **The GWG provides strategic vision, direction and the coordination of a global programme on the use of new data sources and new technologies, which is essential for national statistical systems to remain relevant in a fast-moving data landscape.**
- **Big Data could fill gaps, make statistical operations more cost effective, enable the replacement of surveys and provide more granularities in outputs.**
- **The GWG built the UN Global Platform as a collaborative environment to work together as a global statistical community and to learn together sharing knowledge, data and methods for all countries in the world.**

CONCLUDING REMARKS

Thanks to successful innovation activity statisticians have been able to:

- ❖ lower the response burden, and to promote the utilisation of administrative data. Their data acquisition has become modernised.**
- ❖ Statisticians have introduced new statistical methods and data dissemination channels have diversified.**
- ❖ The organisational and governance structures in the field of statistics have been reviewed, both nationally and internationally.**
- ❖ Productivity has reached a new level.**
- ❖ Networks fostering innovation are being integrated into international statistical co-operation.**

CONCLUDING REMARKS (CONT.)

Despite many fine achievements statisticians still have plenty of work ahead of them.

- To sustain and strengthen the status of official statistics in society, they must invest continuous efforts in strengthening the governance and legislative base of their offices.**
- The need for new statistics is endless and the way statisticians disseminate their products and services needs continuous attention.**
- It is vital that management systems and strategic competence are developed.**
- Statisticians must focus their efforts on the competence and motivation of personnel, and on continuous development of processes.**
- The management of relationships with partners is vital in a networked operating environment.**
- Cost effectiveness of activity must also receive their attention.**