

Executive summary

What is the *Oslo Manual*?

The *Oslo Manual* provides guidelines for collecting and interpreting data on innovation. It seeks to facilitate international comparability, and provides a platform for research and experimentation on innovation measurement. Its guidelines are principally intended to support national statistical offices and other producers of innovation data in designing, collecting, and publishing measures of innovation to meet a range of research and policy needs. In addition, the guidelines are also designed to be of direct value to users of information on innovation.

These guidelines should be viewed as a combination of formal statistical standards, advice on best practices, as well as proposals for extending the measurement of innovation into new domains through the use of existing and new tools.

At present, a large number of countries and international organisations recognise the importance of innovation measurement and have developed capabilities to collect such data. This manual supports this co-ordinated effort in pursuit of robust, internationally comparable data, indicators and analysis.

Why a manual for measuring innovation?

Innovation is central to improvements in living standards and can affect individuals, institutions, entire economic sectors, and countries in multiple ways. Sound measurement of innovation and the use of innovation data in research can help policy makers to better understand economic and social changes, assess the contribution (positive or negative) of innovation to social and economic goals, and monitor and evaluate the effectiveness and efficiency of their policies.

The purpose of this manual is to guide innovation data collection and reporting efforts through a common vocabulary, agreed principles and practical conventions. These can enhance the comparability of statistical outputs and support the progressive development of a global statistical information infrastructure on innovation that is relevant and useful for researchers and decision makers alike.

Jointly published by the OECD and Eurostat, the *Oslo Manual* is a key component of the series of measurement manuals produced by OECD under the title “*The Measurement of Scientific, Technological and Innovation Activities*”. As part of this family of manuals, it addresses the need to reflect how innovation systems operate beyond a description of the efforts made to invest in new knowledge (captured in the OECD *Frascati Manual* on resources dedicated to R&D), or the numbers and characteristics of patented inventions (as covered in the OECD *Patent Statistics Manual*).

The *Oslo Manual* plays a key role in demonstrating and communicating the multidimensional and often hidden nature of innovation. However, there are several outstanding research and policy questions that call for extended and more robust data.

What is innovation?

A key tenet of the *Oslo Manual* is that innovation can and should be measured. The requirement for measurability is an essential criterion for selecting the concepts, definitions and classifications in this manual. This feature sets this manual apart from other documents that conceptualise and define innovation.

Key components of the concept of innovation include the role of knowledge as a basis for innovation, novelty and utility, and value creation or preservation as the presumed goal of innovation. The requirement for implementation differentiates innovation from other concepts such as invention, as an innovation must be implemented, i.e. put into use or made available for others to use.

The term ‘innovation’ can signify both an activity and the outcome of the activity. This manual provides definitions for both. The general definition of an innovation is as follows:

*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).*

This definition uses the generic term “unit” to describe the actor responsible for innovations. It refers to any institutional unit in any sector, including households and their individual members.

This definition is further developed and operationalised to provide the basis for the practical guidelines in this manual for the business sector. 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.

***Innovation activities** include all developmental, financial and commercial activities undertaken by a firm that are intended to result in an innovation for the firm.*

*A **business innovation** is a new or improved product or business process (or combination thereof) that differs significantly from the firm’s previous products or business processes and that has been introduced on the market or brought into use by the firm.*

Compared to the previous edition, a major change for the definition of business innovation in this manual has been the reduction, informed by cognitive testing work, in the complexity of the previous list-based definition of four types of innovations (product, process, organisational and marketing), to two main types: product innovations and business process innovations. The revised definition also reduces the ambiguity of the requirement for a “significant” change by comparing both new and improved innovations

to the firm's existing products or business processes. The basic definitions of a product and business process innovation are as follows:

*A **product innovation** is a new or improved good or service that differs significantly from the firm's previous goods or services and that has been introduced on the market.*

*A **business process innovation** is a new or improved business process for one or more business functions that differs significantly from the firm's previous business processes and that has been brought into use by the firm.*

Business process innovations concern six different functions of a firm, as identified in the business management literature. Two functions relate to a firm's core activity of producing and delivering products for sale, while the other functions concern supporting operations. The taxonomy of business functions proposed in this manual maps reasonably well onto the previous edition's categories of process, marketing and organisational innovations.

Why and how was the manual revised?

Measurement requires an understanding of what needs to be measured and awareness of what can be reliably measured. In response to strong policy demand for empirical evidence on innovation, the *Oslo Manual* addresses both requirements and supports further experimentation to improve and extend innovation data. Increasing societal awareness of innovation-related phenomena has also expanded interest in new targets for measurement. Yet despite these advances, there are still major gaps in the evidence and questions about the role of innovation and what policies can do to influence it. One of the main objectives of this fourth edition of the *Oslo Manual* is to address some of these gaps and outstanding questions.

This edition of the *Oslo Manual* is based on the experience gained from collecting innovation statistics in both OECD and non-member countries since the early 1990s. It is a result of the collective work of the Working Party of national Experts on Science and Technology Indicators (NESTI) and Eurostat's Community Innovation Survey IS Task Force, involving more than 120 experts from nearly 45 countries and international organisations. The revision took place over a three year period and was supported by an expert consultation at its outset and a number of workshops involving key stakeholders throughout the revision. The OECD established a liaison with the International Organization for Standardization's (ISO) technical committee on Innovation Management in order to facilitate greater alignment between definitions.

This and previous revisions to the *Oslo Manual* reflect continual evolution in expert consensus on what can and should be measured. This evolution is due to ongoing changes in economic and social factors, the nature of innovation and how it occurs, as well as the accumulation of measurement experiments and the sharing of experiences among experts.

What are the main novelties of this edition?

This new edition contains a number of major novelties, compared to the previous 2005 edition, to enhance the relevance of the manual as a source of conceptual and practical guidance for the provision of data, indicators and quantitative analyses on innovation. This manual:

- Provides a conceptual framework and a general definition of innovation that is applicable to all sectors in the economy (Business, Government, Non-profit institutions serving households and Households). These are necessary for developing future guidelines for measuring innovation in sectors other than business and eventually building up an economy- and society-wide statistical view of innovation, as recommended in the 2016 OECD Blue Sky Forum.
- Updates and streamlines core definitions and taxonomies to facilitate reporting and interpretation across the entire business sector, including service sector firms specialised in providing knowledge-based services.
- Supports the measurement of investment in intangible assets by making a link between intangibles (also described as knowledge-based capital) and the generation of different types of knowledge for innovation, providing explicit measurement recommendations.
- Provides guidance on measuring internal and external factors influencing business innovation, integrating previous ad hoc guidance on measuring innovation in developing countries, as well as addressing the need to measure the incidence and effect of diverse government policies on innovation.
- Promotes the collection of a broader set of data relevant to both non-innovative and innovation-active firms to help analyse the drivers and enablers of innovation.
- While the baseline definition of innovation in this manual does not require it to be a success, recommendations are provided for measuring attributes of the outcomes of innovation. This aims to facilitate a better understanding of the diverse range of innovations and their impacts on the firm and the market and the broader social context in which it operates.
- Provides extended methodological guidelines for the entire innovation data lifecycle, from survey design and testing to data dissemination and curation. Compared to previous editions of the manual, there is considerably more guidance on methods for assessing question items and the implications of using different survey methods. The importance of the length of the observation period is discussed, highlighting the importance of seeking greater international convergence in survey practices.
- Extends guidance on the linkage of surveys with other sources, such as administrative records, and proposes complementary methods for obtaining evidence on a firm's focal (i.e. most important) innovation. Integrating an object-based approach can deliver significant improvements in survey data quality.
- Supports users of innovation data with a new chapter explaining the use of statistical data on innovation to construct indicators and for analysis. It presents a blueprint for the production of statistical indicators of innovation by thematic areas, drawing on the recommendations in previous chapters. It also describes methods for analysing innovation data, with a major focus on the analysis of innovation impacts and the empirical evaluation of innovation policies.
- Provides a glossary of key terms for ease of reference and to facilitate translation efforts to different languages.

In addition, this manual contributes to a better understanding of digitalisation and its links with innovation by providing guidance on the role of digitised information from both a

product and business process innovation perspective. It also achieves this goal by recognising data development activities, along with software, as a potential innovation activity; highlighting data management competences as a key potential innovation capability for measurement, as well as recommending the measurement of external factors such as the role of digital platforms in the markets in which the firm operates.

The analysis of globalisation and how it shapes innovation is supported by guidance on capturing knowledge flows with the rest of the world and the role of multinational enterprises (MNEs) and mapping the position of a firm's business processes within value chains. International coordination is called for when interpreting data on the role of MNEs.

The *Oslo Manual's* recommendations for data collection are limited to the Business enterprise sector (including public – i.e. government controlled – enterprises) and focus principally on statistical survey methods for representative samples of units within the business population. However, the recommendations also cover complementary data sources and collection methods, including administrative sources and big data, pointing to an integrated use of sources and methods to address user needs.

How are the guidelines intended to be used?

The manual is a statistical resource that contains guidelines for applying concepts, definitions, classifications, taxonomies and statistical methods for collecting innovation statistics about the Business sector. The manual makes recommendations and identifies possible approaches for experimentation. Within the OECD context, the recommendations are not mandatory, but member countries are nonetheless expected to adopt the recommendations to the best of their ability. This is required in order to produce internationally comparable data that can constitute a global public information good on innovation.

The manual allows for a significant degree of discretion on how different countries or groups of countries carry out their data collection activities. As measurement results are sensitive to the choice of survey methods, it is difficult to obtain international comparability without uniformity in data collection and reporting practices. Although uniformity is not feasible in an OECD or global setting, greater convergence in methods should be possible and aimed for. To this end, the OECD works with other international organisations and networks that support statistical capability development and the sharing of experiences on collecting innovation data.

Although not designed with this purpose in mind, the manual can provide a reference for policy or regulatory uses, for instance linking policies to specific innovation activities and outcomes described in the manual. In addition, the adoption of its concepts and definitions by innovation managers and practitioners will facilitate data collection.

Where to find additional relevant resources?

As a statistical standard, the *Oslo Manual* is freely available on line in multiple formats. Additional online annex material is expected to be developed and evolve to complement guidance in the manual's printed edition, following the example of the 2015 edition of the *Frascati Manual*. Relevant resources, including links to updated classifications and statistics on innovation published by the OECD, Eurostat and other international and national bodies, can be found at <http://oe.cd/oslomanual>.

Part I. Introduction to the measurement of innovation



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