OSLO MANUAL 2018: GUIDELINES FOR COLLECTING, REPORTING AND USING DATA ON INNOVATION

OECD-NBS International Training Workshop on Innovation Statistics
16-18 July 2019 Xi'an, China

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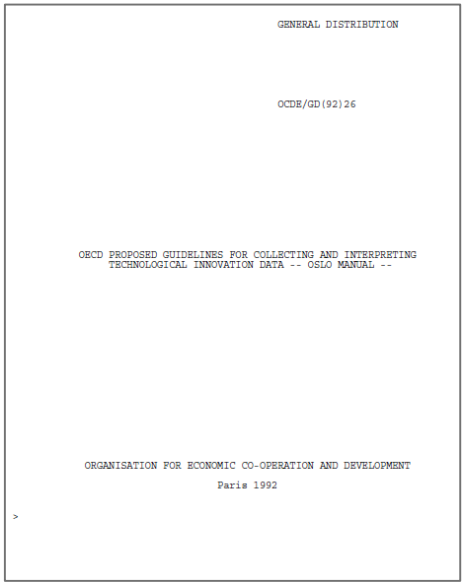
BETTER POLICIES FOR BETTER LIVES

The origins of the Oslo Manual

- OECD statistical guidelines for measuring innovation
  - A common language to discuss and measure innovation
  - Not legally binding document
  - Consensus view on best practice
- Two distinctive features:
  - Concerned with the measurement of innovation within the business enterprise sector
  - Provides guidelines for survey-based measurement of innovation



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OECD PROPOSED GUIDELINES FOR COLLECTING AND INTERPRETING TECHNOLOGICAL INNOVATION DATA -- OSLO MANUAL --

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Paris 1992

1992

A manual in evolution


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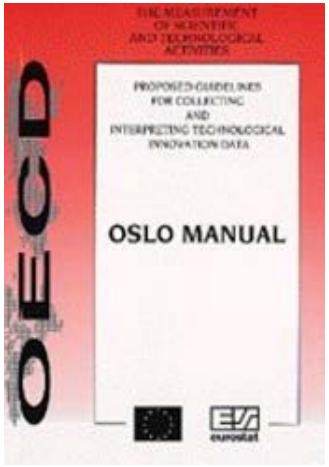
Paris 1992

[1992](#)

Oslo 1st edition

Technological innovation; Manufacturing

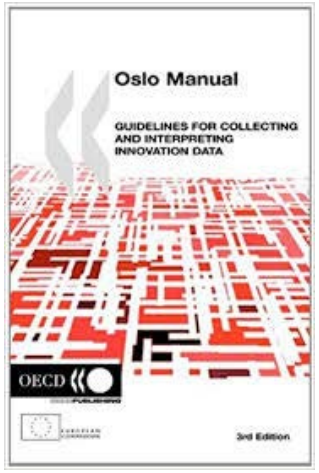


[1997](#)

Oslo 2nd edition

Technological innovation;

Manufacturing and most market services



[2005](#)

Oslo 3rd edition

Product, process, organisational, marketing innovations.

[2018](#)

Oslo 4th ed.

Published jointly by OECD and Eurostat since 1997

Third revision of the Oslo Manual: 2016-2018

Kick off workshop, Research Council, Oslo, December 2015

Final workshop and approval, FECYT/Ministry of the Economy, Madrid, December 2017

- Responsibility of the OECD Working Party of National Experts on Science and Technology Indicators (NESTI), together with ESTAT STI Working Group.
- Extensive preparatory work before revision
  - Cognitive testing of concepts
  - Ad hoc studies on measurement of innovation and services, design, innovation policies
  - Distributed microdata work (Innovation in firms).
- Engagement of 40+ countries and international organisations
  - International steering group.
- Expert and stakeholder workshops
  - OECD and ESTAT committees
  - Workshops hosted by academics and national governments

The 2018 edition

Part I. Introduction to the measurement of innovation

1. Introduction to innovation statistics and the Oslo Manual

2. Concepts for measuring innovation

Part II. Framework and guidelines for measuring business innovation

3. Concepts and definitions for measuring business innovation

4. Measuring business innovation activities

5. Measuring business capabilities for innovation

6. Business innovation and knowledge flows

7. Measuring external factors influencing innovation in firms

8. Objectives and outcomes of business innovation

Part III. Methods for collecting, analysing and reporting statistics on business innovation

9. Methods for collecting data on business innovation

10. The object method for innovation measurement

11. Use of innovation data for statistical indicators and analysis

Glossary of terms

Conceptualising innovation

- Common use of term “innovation” refers to either
  - Notion of process of innovation (what is done by a subject)
  - Notion of outcome (what comes out) = an innovation
- Both are relevant and need to be measured.
  - “Outcome” view conceptualised in this manual as: “Innovation(s)”
  - “Process” view conceptualised as “Innovation activity(ies)”
- Innovation
  - More than ideas, implementation required
  - Not necessarily R&D-based
  - At least new to the subject
  - Success is aimed at, but neither guaranteed nor required

➔ The general concept of innovation:
Implementation of something new to meet a given objective.

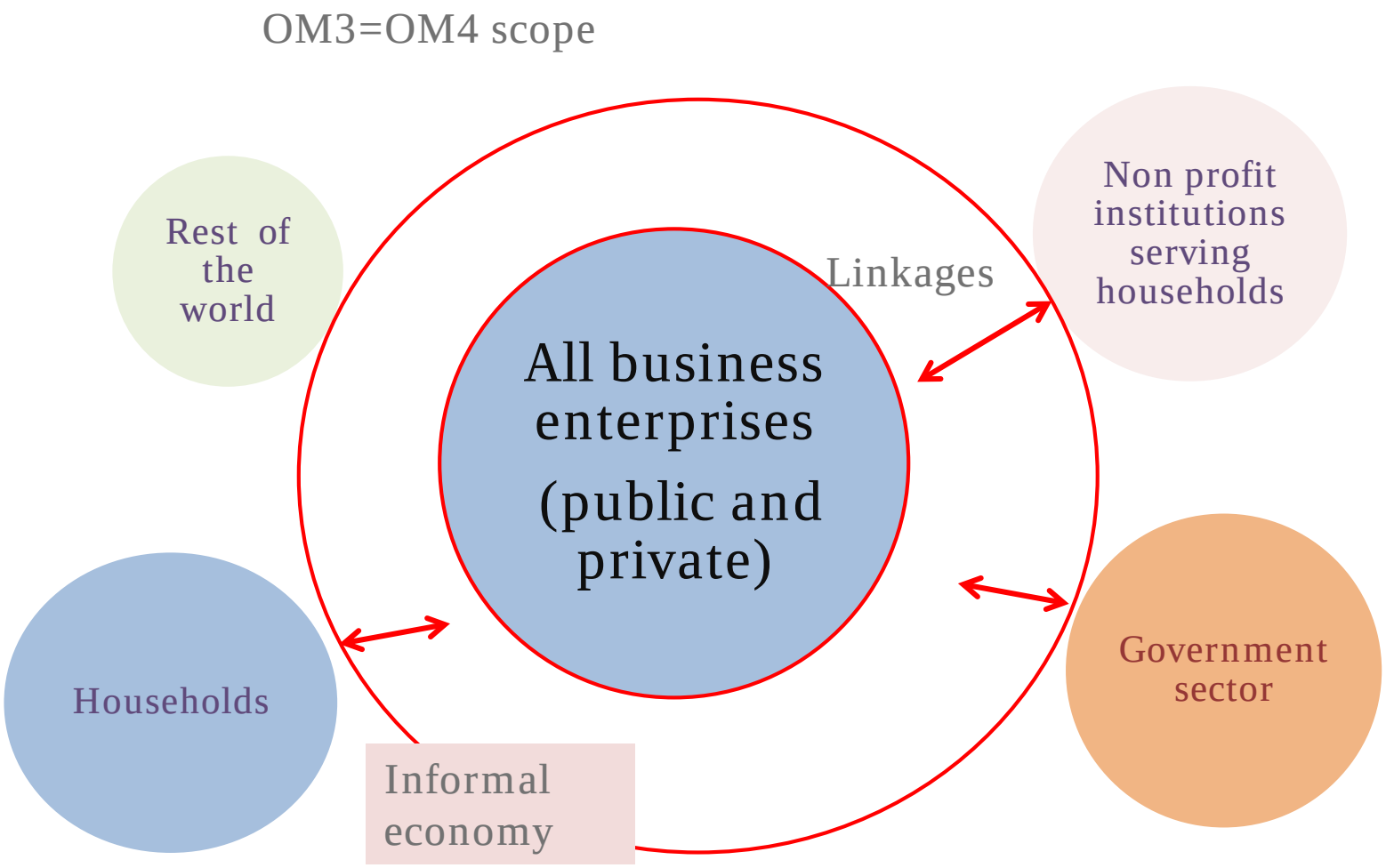
General definition of innovation for measurement purposes

"An innovation is

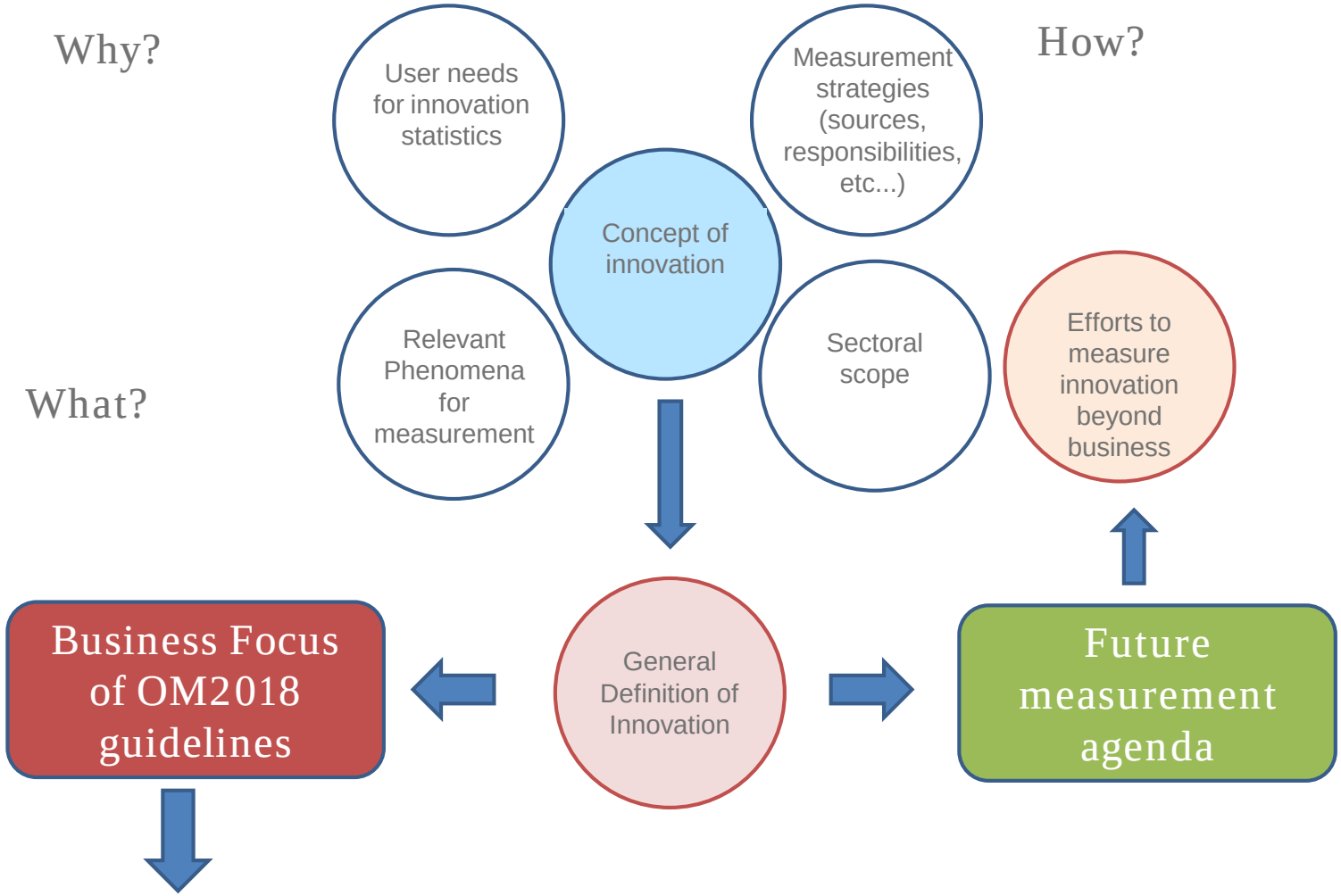
- *a new or improved product or process (or combination thereof)*
- *that differs significantly from the unit's previous products or processes and*
- *that has been made available to potential users (product) or brought into use by the unit (process)."*

The generic term 'unit' describes the actor responsible for innovations. It refers to any institutional unit in any sector, including households and their individual members

Sectoral scope of practical guidance in this edition



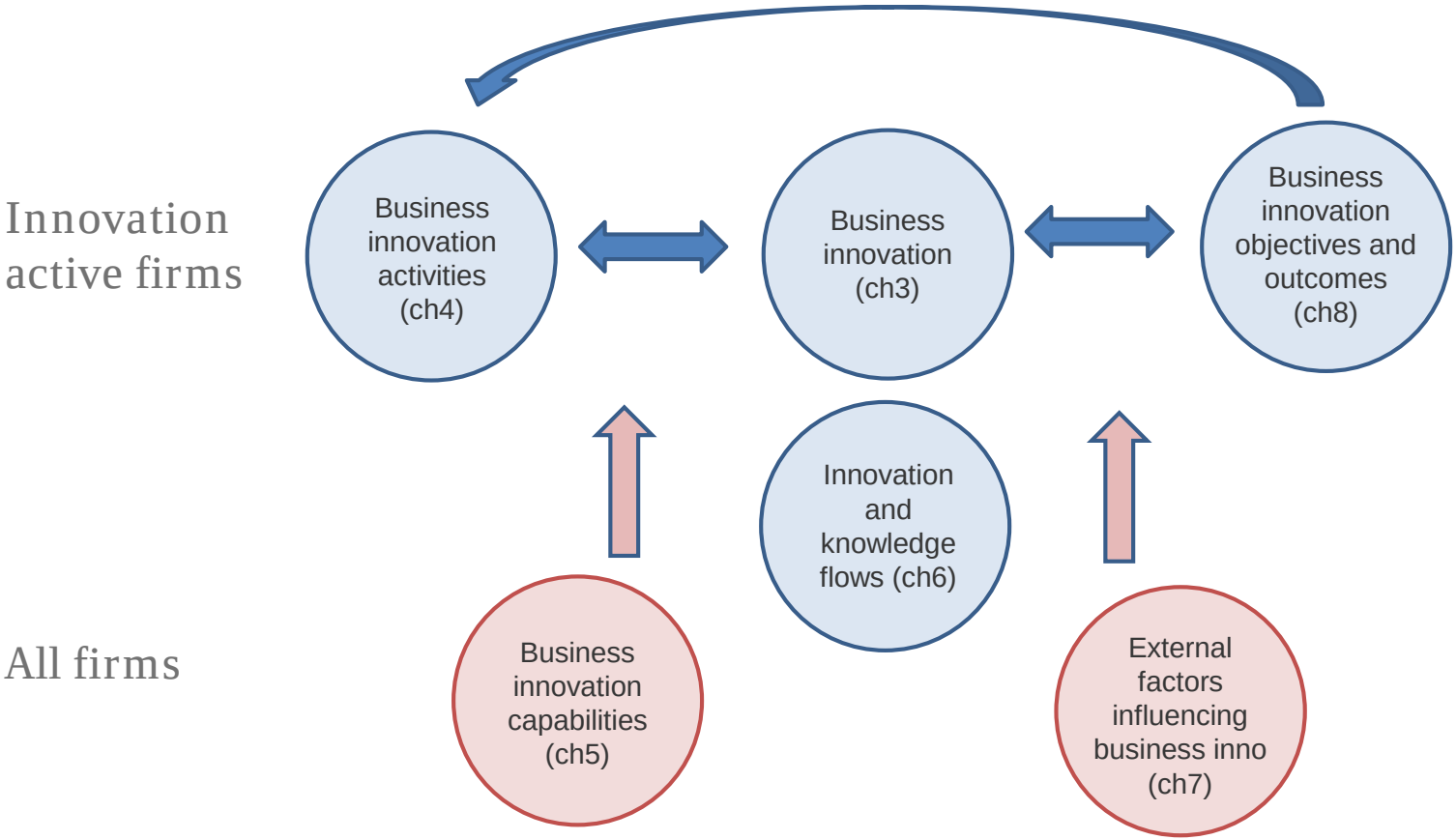
OM2018 Chapter 2. Concepts for measuring innovation



Central part of OM 2018: Framework for measuring business innovation

Covered in OM 2005

New in OM 2018



Revised innovation definitions for the business sector

Business innovation (ch3)

*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.*

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

Types of business innovation

- *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.*

  -> Goods and services. This edition clarifies role of knowledge products that share features with both.

- *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.*

Taxonomy of business processes

- Based on the full array of business functions
- All functions potentially subject to improvements that qualify as innovations

	Business functions devoted to
1.	Production of goods and services
2.	Distribution and logistics
3.	Marketing and sales
4.	Information and communication technology (ICT)
5.	Administration and management
6.	Product and business process development

- Differs only slightly from OM2005 but has more solid conceptual and practical basis

Innovation activities

Business innovation activities (ch4)

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 range of knowledge-based activities highlighted for identification as potential loci of innovation activity:

- *Research and experimental development (R&D) activities*
- *Engineering, design and other creative work activities*
- *Marketing and brand equity activities*
- *Intellectual property (IP) related activities*
- *Employee training activities*
- *Software development and database activities*
- *Activities relating to the acquisition or lease of tangible assets*
- *Innovation management activities*

Identify also when activity carried out by another party.

Identify expenditures associated to those items – total (KBC estimates) and separating the amounts incurred in pursuit of innovation.

Innovation within the innovation system: Innovation and knowledge flows

Innovation and knowledge flows (ch6)

The chapter about “open innovation” and “knowledge exchange”

- Outbound dimension of innovation complementing traditional inbound focus
- Sources of knowledge, collaboration partners
- Recommended focus on knowledge exchange channels with PRIs and HEs

Understanding internal and external factors shaping innovation in the firm and outcomes

Business innovation capabilities (ch5)

- Management
- IP
- Human resources
- Technology in broad sense (technical, design, user engagement, digital)

External factors influencing business innovation (ch7)

- Markets
  - Position in value chain, supply, demand, platforms
- Public policy – including government support
- Society and environmental aspects

Business innovation objectives and outcomes (ch8)

- Objectives – outcomes
- Impacts on market
- Quantitative measures

Collection and use of data on business innovation

Covered in OM 2005

New in OM 2018

Business innovation survey methodology (ch9)

Aimed at data producers:
Lifecycle perspective on survey data collection and integration

Recommend convergence in country practices based on recent evidence

Object-based approaches to measurement (ch10)

Complementary focus on most important innovation (or change) of the firm

Data use: indicators and analysis (ch11)

Chapter intended for users of innovation data

- Types of innovation indicators
- Construction of indicators
- Analysis using innovation data

Cross cutting issues

- Digital-proofing
  - Digital products, ICT business processes, platforms, digital capabilities, digital tools for measurement.
- Globalisation
  - Global markets
  - Cross boundary links within MNEs
  - Location of business process functions, aligned to business process innovation questions.
- Contribution to capacity building
  - Guidance on developing countries in previous annex mainstreamed into core document (esp. chapters on internal and external drivers)
  - Detailed methodology guidance for producers and users

Policy and broader relevance of the OM

Demonstrated but in need of strengthening

- Source of guidance for data collection
- Source of definitions and concepts used in policy documents at OECD, EU and country level
- Relevance to academics/researchers
- *Policy relevance of statistical data collected under OM guidelines*

To be demonstrated through implementation

- Relevance to business
  - Value to respondents?
  - Innovation management
- Broader statistical relevance
  - Better measuring the changing economy

OECD Innovation data resources

- The Oslo Manual website
  - http://oe.cd/oslomanual
- OECD Innovation Statistics and Indicators
  - http://www.oecd.org/innovation/inno/inno-stats.htm
- Community of practice on innovation data
  - Password protected, for practitioners: https://community.oecd.org/community/oslo-review

Other data resources using Oslo Manual guidelines

Eurostat Community Innovation Survey (CIS) indicator database

Innovation indicators from the CIS for selected member states of the European Statistical System (ESS): http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database.

Ibero-American/Inter-American Network of Science and Technology Indicators (RICYT)

Innovation indicators for manufacturing and service industries for selected Ibero-American countries: www.ricyt.org/indicadores.

UNESCO Institute for Statistics (UIS) Innovation Data

Global database of innovation statistics focused on manufacturing industries: http://uis.unesco.org/en/topic/innovation-data.

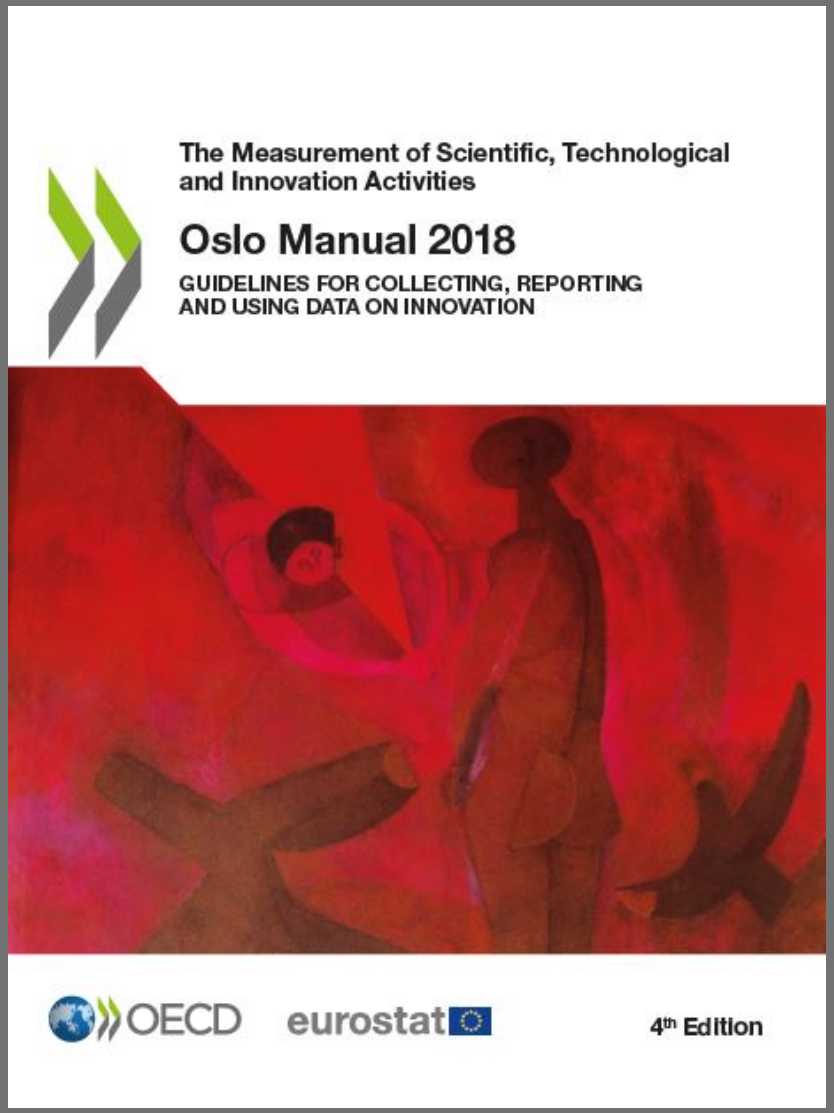
The **NEPAD (New Partnership for Africa's Development) for the African Union** is also active in promoting the use of comparable indicators in Africa. Online links to this manual will provide up-to-date links to international and national sources of statistical data and indicators on innovation.

Beyond the 2018 edition

OECD

OECD BLUE SKY III

The 2108 Oslo Manual as Platform for extending measurement of innovation following the 2016 Blue Sky Agenda



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ADDITIONAL MATERIAL

ANNEX ON CHAPTER 9

Sections

- 1.2 Population and other basic characteristics for a survey
  - Reporting unit, main economic activity, unit size, frequency of data collection, observation and reference periods
  - Recommendation that the observation period should not exceed the frequency of data collection

Sections

- 1.3 Question & questionnaire design
  - Question design: translation, comprehension and response categories
  - Questionnaire design: filters, question order, combining innovation with other business surveys
  - Questionnaire testing: cognitive testing and pilot surveys
  - Recommendation to conduct cognitive testing

Sections

- 1.4 Sampling
  - Survey frame, census versus sample, stratified sampling
  - Longitudinal panel data and cross-sectional surveys
  - Recommendations on sampling fractions, cells defined by industry and size classes

Sections

- 1.5 Data collection methods
  - Postal, online, telephone, face-to-face, combined survey methods
- 1.6 Survey protocol
  - Support for respondents, mandatory and voluntary surveys, non-response follow-up, conducting non-response surveys
  - Recommendations for when to conduct a non-response survey: response rates < 70%

Sections

- 1.7 Post-survey data processing
  - Error checks, imputation of missing data, calculating weights
- 1.8 Publication and dissemination of results
  - Metadata and quality reports, data access
  - Recommend improving data access if NSOs lack resources for in-house analyses

ANNEX ON CHAPTER 11

Why this new chapter?

- Need to consider both the production and use of business innovation data
  - Relevance and use as quality criteria
  - Variety of users and potential users
  - Address paradox and challenge of innovation indicators without OM-based innovation data
- Capitalise and further promote good use of data as indicators and analysis based on all types of innovation data (macro and microdata)

Data and indicators on business innovation

- Data, statistical data, stat data about innovation
- Statistical indicators-> Innovation indicators
- Desirable properties of innovation indicators– a reminder of quality requirements
- Basic principles
  - International comparisons
- Sources for international resources

Methodologies for *business innovation* indicators

- Aggregation and simplification
  - From microdata to macro. Relevant uses.
  - Reducing complexity – composite indicators and classification schemes
- Indicator development and presentation for international comparisons
    - Innovation headline indicators, dashboards, scoreboards, composite indexes.
    - Advantages and limitations.
- Firm-level data
  - Micro-level scoreboards. Some health warnings.

A blueprint for producing indicators on business innovation

1. User needs
2. Choice of indicators
3. Choice of data sources
4. Interpretation

Broad thematic areas – matching the manual's part 2

Table 11.3. Thematic areas for business innovation indicators

Thematic area	Main data sources	Relevant *OM4* chapters
Incidence of innovations and their characteristics (e.g. type, novelty)	Innovation surveys, administrative or commercial data (e.g. product databases)	3
Innovation activity and investment (types of activity and resources for each activity)	Innovation surveys, administrative data, IP data (patents, trademarks, etc.)	4
Innovation capabilities within firms[1]	Innovation surveys, administrative data	5
Innovation linkages and knowledge flows	Innovation surveys, administrative data, bilateral international statistics (trade, etc.), data on technology alliances	6
External influences on innovation (including public policies) and framework conditions for business innovation (including knowledge infrastructure)[1]	Innovation surveys, administrative data, expert assessments, public opinion polls, etc.	6,7
Outputs of innovation activities	Innovation surveys, administrative data	6,8
Economic and social outcomes of business innovation	Innovation surveys, administrative data	8

1. New thematic area for this edition of the manual (*OM4*).

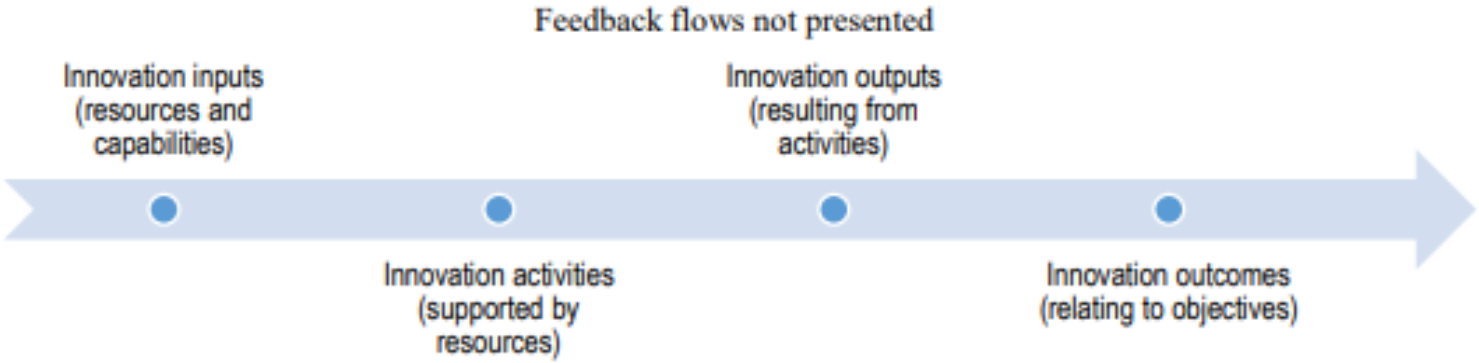
Other indicator issues

- Official vs non official sources
- The role of survey data
- Direct and indirect measurement
- Change vs position indicators
- Simple -> Complex indicators
- Limits of indicators

Using data on innovation to analyse innovation performance, policies and impacts

- Descriptive multivariate analysis – examples
- Inference of causal effects in innovation analysis

Figure 11.1. Logic model used in evaluation literature applied to innovation

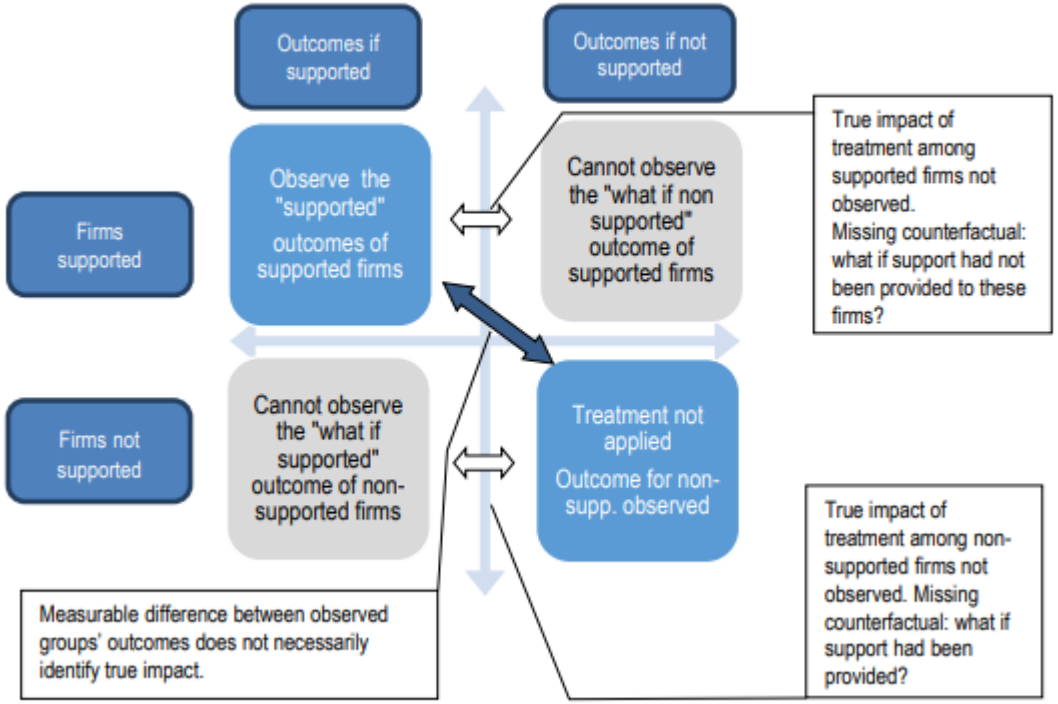


Source: Adapted from McLaughlin and Jordan (1999), "Logic models: A tool for telling your program's performance story".

Why measuring innovation impact is difficult

Figure 11.2. The innovation policy evaluation problem to identifying causal effects

Observed outcomes and unobserved counterfactuals in a business innovation support example



Source: Based on Rubin (1974), "Estimating causal effects of treatments in randomized and nonrandomized studies".

- Direct and indirect methods.
- The CDM framework

Policy analysis

- Specific implications for data collection and analysis
- Procedures
- Coordinated analysis of innovation microdata across countries