

Defining Innovation

(Based on “Oslo Manual”, 3rd edition, 2005)

An **innovation** is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.

The minimum requirement for an innovation is that the product, process, marketing method or organizational method must be new (or significantly improved) to the firm.

Innovation activities are all scientific, technological, organizational, financial and commercial steps which actually, or are intended to, lead to the implementation of innovations. Innovation activities also include R&D that is not directly related to the development of a specific innovation.

An **innovative firm** is one that has implemented an innovation during the period under review.

Main types of innovation

1) A **product innovation** is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics. Product innovations can utilize new knowledge or technologies, or can be based on new uses or combinations of existing knowledge or technologies.

2) A **process innovation** is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software. Process innovations can be intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products.

3) A **marketing innovation** is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing. Marketing innovations are aimed at better addressing customer needs, opening up new markets, or newly positioning a firm's product on the market, with the objective of increasing the firm's sales.

4) An **organizational innovation** is the implementation of a new organizational method in the firm's business practices, workplace organization or external relations. Organizational innovations can be intended to increase a firm's performance by reducing administrative costs or transaction costs, improving workplace satisfaction (and thus labor productivity), gaining access to non-tradable assets (such as non-codified external knowledge) or reducing costs of supplies.

Box 1: Defining innovation

Defining Research and Development (R&D)

(Based on OECD's "Frascati Manual", 2002 edition)

In accordance with the approach advocated by the Frascati Manual, this study defines R&D as "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications".

The term "research and experimental development" is used as synonymous to the term "research and development" and both are abbreviated by the expression "R&D".

The term R&D covers three activities: basic research, applied research and experimental development:

Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.

Applied research is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed. R&D covers both formal R&D in R&D units and informal or occasional R&D in other units.

Box 2: Defining research and development

The boundaries of R&D: Clarification of specific cases

(Based on OECD's "Frascati Manual")

The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty.

A prototype is an original model constructed to include all the technical characteristics and performances of the new product. The design, construction and testing of prototypes normally falls within the scope of R&D.

The construction and operation of a **pilot plant** is a part of R&D as long as the principal purposes are to obtain experience and to compile engineering and other data.

Those elements of **industrial design** work, which include plans and drawings aimed at defining procedures, technical specifications and operational features necessary to the conception, development and manufacturing of new products and processes.

Clinical trials are divided into four standard phases, three of which take place before permission to manufacture is accorded. By convention, clinical trial phases 1, 2 and 3 can be treated as R&D. Phase 4 clinical trials, which continue testing the drug or treatment after approval and manufacture, are treated as R&D only if they bring about a further scientific or technological advance.

Box 3: Boundaries of research and development