Explanatory Notes on Main Statistical Indicators

Patent

is an abbreviation for the patent right and refers to the exclusive right of ownership of the inventors or designers for the creation or inventions, given from the patent offices after due process of assessment and approval in accordance with the Patent Law. Patents are granted for inventions, utility models and designs. This indicator reflects the achievements of S&T and design with independent intellectual property.

Research and Experimental Development (R&D)

refers to creative and systematic work undertaken in order to increase the stock of knowledge (including knowledge of humankind, culture and society) and to devise new applications of available knowledge. R&D includes three categories of activities: basic research, applied research and experimental development. Basic research and applied research are collectively referred to as scientific research. R&D activities should meet five conditions: novelty, creativity, uncertainty, systematicness, and transferability (reproducibility).

Basic Research refers to experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. Basic research usually formulates hypotheses, theories or laws, and its results are mainly released or disseminated in the form of scientific papers or monographs or research reports. It includes pure basic research and directed basic research. Pure basic research is the basic research carried out to increase new knowledge, without the pursuit of economic or social benefits or the application of results. Directed basic research is basic research that provides a certain aspect of basic knowledge for the identification and solution of currently known or foreseeable problems in the future.

Applied Research refers to original investigation undertaken in order to acquire new knowledge. It is directed primarily towards a specific, practical aim or objective. Purpose of the applied research is to identify the possible uses of results from basic research, or to explore new (fundamental) methods or new approaches. Results of applied research are expressed in the form of scientific papers, monographs, fundamental models or invention patents.

Experimental Development refers to systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes. Results of experimental development activities are embodied in patents, exclusive technology, and monotype of new products or equipment.

R&D Personnel

refer to persons of R&D activities units engaged in basic research, applied research, and experimental development at the reference period, including persons of directly participating in the three activities above, as well as management and direct service staff related to R&D activities, such as literature provision, material supply, equipment maintenance staff, it excludes persons providing indirect support and ancillary services, such as canteen and security staff.

R&D Personnel as Full-time Equivalent

refers to the ratio of working hours actually spent on R&D during a specific reference period (usually a calendar year) divided by the total number of hours conventionally worked in the same period by an individual or by a group. The measurement unit of the ratio is “man-years”. This is an internationally comparable indicator of S&T manpower input.

Technology Market

can be regarded narrowly as technical-dealings place where technique transfer is made or technology-related good traded at certain time. As shown in statistical datum presently, turnovers are resulting either from purchase or from transfer of techniques, together with numbers related to the inquiry or services involved in technologies.

Innovation

refers to the introduction of new or significantly improved products or process by enterprises. It must be new to the enterprise, but it is not necessarily new to other enterprises or the whole market.

Product Innovation refers to the introduction of new or significantly improved products by enterprises. The innovation should be reflected by the functions or features of the products including improvement on technical specifications, materials, parts, user-friendliness etc. Simple appearance change or other subtle changes are not included, neither is direct reselling. It must be new to the enterprise, but it is not necessarily new to other enterprises or the whole market.

Process Innovation refers to the adoption of new or significantly improved production methods, process equipments or supporting activities by enterprises. The innovation should be reflected by technology, equipment, or process. It must be new to the enterprise, but it is not necessarily new to other enterprises or the whole market Simple change of organization and management mode is not included. Supporting activities cover purchase, logistics, account, and compute activities.

Organizational (management) Innovation refers to the adoption of a completely new organizational management mode, which has never been used before. It mainly involves the business model, organizational structure, or external relations of enterprises. It does not include pure mergers or acquisitions. Organizational (management) innovation should be the result of strategic decision-making of enterprise management. The term "new" here means that it must be new to the enterprise, but not necessarily new to other enterprises.

Examples of innovation on organizational (management) include first-time use of chain management, quality management, and information sharing system; in terms of organizational structure, examples of organizational (management) innovation include first-time use of institutional settings, division of responsibilities, authority management, decision-making methods, etc.; in terms of external relations, examples of organizational (Management) innovation include the first use of business alliances, new cooperation, outsourcing or subcontracting, etc.

Marketing Innovation refers to the adoption of brand-new marketing concepts or marketing strategies that have never been used before. It mainly involves product design or packaging, product promotion, product sales channels, product pricing and so on. It does not include seasonal, cyclical, and other conventional marketing changes. The term "new" here means that it must be new for its own business, but not necessarily new for other businesses or the whole market.