



## Patent Data Analytics and Terminology

### *USPTO Data*

The patents referred to in analyses throughout *Science and Engineering Indicators 2018* are registered with the U.S. Patent and Trademark Office (USPTO), the federal agency responsible for handling patent and trademark applications in the United States. USPTO executes these processes for U.S. intellectual property management, coordinating more than 6,000 patent examiners and 5 patent offices across the United States, and it provides access to its data through several different portals.

### *PatentsView Database*

PatentsView is the data source used for much of the analyses of patenting behavior presented in *Science and Engineering Indicators 2018*. It is a data analysis and visualization platform for USPTO data developed by USPTO in collaboration with other federal agencies and academic institutions. In addition to parsing, structuring, and standardizing patent data, the PatentsView initiative makes considerable efforts to disambiguate names and locations in USPTO patent data while also associating patents with their relevant technology fields based on multiple taxonomies.

### *Patent Technology Areas*

The PatentsView database classifies patents under four different taxonomies: Cooperative Patent Classification, World Intellectual Property Organization (WIPO), U.S. Patent Classification, and National Bureau of Economic Research. For *Science and Engineering Indicators 2018*, the WIPO classification is applied, which divides patents into 35 categories based on International Patent Classification (IPC) codes. Each patent can be tagged with multiple IPC codes and can thus fall under multiple WIPO technology areas. The U.S. Patent Classification is also used to identify patents related to clean technologies.

### *Matching Citations to Nonpatent Literature*

Patents cite other patents, showing how a novel invention builds on and distinguishes itself from other patents within the existing technological ecosystem. Some citations show the connection between inventions and a broader ecosystem, citing nonpatent literature (NPL). Matching these citations to peer-reviewed scientific publications is of interest as a means by which to assess the uptake of research in subsequent development efforts.

The matching of NPL citations from PatentsView to records in Scopus is done by an algorithm that extracts and parses publication titles; publication years; author names; and names or abbreviated names of research journals and conference proceedings, volume and issue numbers, and page ranges. These extracted data are then algorithmically compared with information extracted from the Scopus database (see sidebar Bibliometric Data and Terminology in Chapter 5) to match NPL citations in PatentsView to their cited publications appearing in Scopus.

### ***Patent-Related Indicators in Indicators 2018***

#### *Patents Granted*

This indicator reflects the number of patents granted to a country, sector, or organization. Patents are attributed using the fractional counting method (see sidebar Bibliometric Data and Terminology in Chapter 5). Patents also have inventors (one or more) and grantees, where the latter become the owners of the intellectual property covered by the patent. For most scores presented in this chapter, this indicator presents the fractional count of patents by inventor, although some present information by grantee; the notes for tables and figures always specify the approach. More than 143,000 patents were granted to U.S. inventors in 2016 (Appendix Table 8-4).

### *Patenting Activity Index*

For any given area of technological development, the Patenting Activity Index indicates the extent to which a country specializes in that area. It is an output measure of specialization, assessing the share of a country's patents produced in each technological area. The indicator is computed by comparing a country to the global average. In 2016, for instance, the United States produced about 3,300 of its 143,000 patents in IT methods for management. By comparison, at the world level, only about 4,400 of 304,000 total patents were granted in IT methods for management (Appendix Table 8-4 and Appendix Table 8-10). Thus, the United States produces more patents in this area than expected, based on its total output and the world proportions.

This indicator is indexed to 1.00, which represents the world level, meaning that a score above 1.00 shows that a country produces more of its patent output in the given technological area than the global proportion, whereas a score below 1.00 shows that a country produces fewer patents in this technological area than the global average. Whenever a country's share of patents in one area increases, its share in other areas must decrease proportionately.