

Technologies

A technology-based approach can be a helpful analytical angle for understanding how firms innovate and how these efforts can be supported through public policy. Focusing on technologies provides an appreciation of the state-of-the-art in a given field, and allows us to better understand its evolution and the relationships between knowledge flows and value chains. Firms, researchers, infrastructures, resources and institutions are devoted to advance specific technologies that will ultimately bring better products and services to markets. These actors and assets, along with their interactions, delineate what are referred to as technological innovation systems.* Such systems often form technological clusters that are geographically concentrated a la Silicon Valley. This understanding may reveal concrete policy actions in the form of instruments such as technology matching services, technology diffusion assistance schemes and technology extension services.

The dynamics of technological change are specific to particular technology areas. As a given solution to a technological problem becomes prevalent when a critical mass of users adopt it, a technological paradigm is formed. A paradigm gives rise to specific managerial practices, organisational structures, industrial networks, regulations and cultural acceptance. This “sticky” process makes technological change cumulative and path-dependant. The interplay between scientific advances, economic factors and institutional arrangements, innovations brings about certain technology development paths called [technological trajectories](#) [1].

* For a recent conceptual paper see Bergek, A. Hekkert, M. Jacobsson, S. Markard, J. Sandén, B. and Truffer, B. (2015) Technological innovation systems in contexts: Conceptualizing contextual structures and interaction dynamics, Environmental Innovation and Societal Transitions, Volume 16, Pages 51-64, ISSN 2210-4224, <http://dx.doi.org/10.1016/j.eist.2015.07.003> [2].

Nanotechnology

Nanotechnology is the set of technologies that enables the manipulation, study or exploitation of very small (typically less than 100 nanometres) structures and systems. To put this into perspective, one nanometre is one-billionth of a metre, or around 80,000 times smaller than the diameter of a human hair. Nanotechnology contributes to novel materials, devices and products that demonstrate different properties. [Read more...](#) [3]

ICTs

Effective Information and Communication Technologies (ICT) may facilitate innovation by improving information exchange and knowledge diffusion incurred in the production of innovations, foster growth by reducing production costs and increasing productivity, and expand the market for innovative products and services. While the use of ICT has grown steadily over the past decade, it substantially varies... [Read more...](#) [4]

Biotechnology

Biotechnology is the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services. Biotechnology today is used in primary production, health and industry. Platform technologies such as genetic modification, DNA sequencing, bioinformatics and metabolic pathway engineering have commercial uses... [Read more...](#) [5]

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