

# innovations

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## From systemic innovations to complex innovation systems: *Innovations* Forum

Editorial Committee of *INNOVATIONS*

Almost 30 years! [\*Innovations. Revue d'économie et de management de l'innovation/Journal of Innovation Economics and Management\*](#) will celebrate 30 years of presence in the French-speaking and international scientific landscape next year... Sometimes “normal” and “iconolatrous”, sometimes “paradoxical” and “iconoclastic”, *Innovations* has forged a solid trajectory of growth and diversification (thematic, methodological, intra- and inter-disciplinary): its readership, distribution, and referencing bear witness to this.

Flashback... In 1994, in a cubbyhole on the fourth floor of a new, out-of-the-way provincial university, in a city then in industrial crisis, desolate and inhospitable, facing a stormy sea, *Innovations* (like all innovations) was painfully born. The first issue was published in 1995... The first reaction of right-thinking people: let's hope there'll be a sequel! But as obstinacy is the mother of innovation and the confidence of partners its support (first and foremost its publisher, L'Harmattan - Paris, and its first scientific committee), *Innovations* quickly saw its readership grow, its editorial staff believe in it and invest themselves in it with selflessness, and its contributors become enthusiastic. First lesson: the launch of a “company” is conditioned by the quality, persistence, and reliability of the systemic relationships it weaves, both within and outside the company (as well as the permanence of their renewal). And then there's the question of management. But that's another story...

In 2007, *Innovations* changed publishers: De Boeck Université (Brussels) and the Cairn platform for the distribution of scientific publications gave the journal the perspective of structuring the French-speaking academic field (and beyond!) of innovation research. When, in 2008, the first issue was published entirely in English (*Journal of Innovation Economics & Management*), the editorial and scientific committees, necessarily international, took the international development of the journal in hand. *Innovations* is now co-published by De Boeck and the Research Network on Innovation.

In an intellectual field whose keyword is innovation, the journal's editorial committees were quick to take sides to avoid any misunderstanding! From the outset, innovation was seen as the design and marketing of a new product or technology, the use of new production processes and organizational modes and models, or the conquest of new markets. Just as quickly, the “network” has supplanted the “I did it myself” myth: creativity and innovation are the result of interaction between organizations, universities, public institutions, and consumers. Innovation networks create new knowledge (not just marketable) and contribute to its dissemination, embodied in new modes of production and distribution. Innovation is the result of technological, organizational, and distribution changes.

How does the “innovator” emerge and behave? How do companies design innovation processes? What impact does innovation have on a company’s competitiveness and performance? General idea: training, appropriation, and valorization of knowledge and skills in a context of strong real or latent competition and an increasingly high degree of capital turnover. Application: context, method, arguments, evidence... critical analysis...

Now that it’s time to take stock, the journal is committed to promoting, at the microscopic level, relevant and innovative approaches and methodologies for analyzing a company’s technological opportunities, organizational strategies, and the integrated management of research and development projects, marketing, and finance, and the most appropriate management tools for better understanding how to operationalize and implement innovation. At the macroscopic level, scientific progress, technological change, the entrepreneurial spirit, organizational behavior, market reconfiguration, public policies, changing social relations, economic cycles - in a context of renewal (often forced, induced, maintained) of people’s needs at a frantic pace, the journal helps to mark out new roads and define the many alternative paths to growth, where social, environmental, sustainable, responsible ... innovation has its rightful place.

The plethora of subjects covered in the above themes, combined with the scientific interests of readers and academic research trends in economics, management, and engineering, have been selected to form the backbone of the journal’s consolidated editorial line for the coming years.

Systemic innovations are intelligent assemblies of innovations resulting from new combinations of productive resources. They are formed by the diffusion/adaptation of a nodal innovation which is at the center of the socio-technical system. This centrality is due to the technological characteristics and potential applications of this innovation, which is presented as a complex system made up of a multitude of specific systems of R&D activities and production of tools and knowledge (e.g. biochemistry, digital). This innovation is disseminated and transformed by interactions between players (individuals, organizations), through incremental innovations within and between sectors, as well as through complementary innovations... in a context of open innovation within the sociotechnical innovation system, which is itself naturally unstable. This process leads to the creation of new innovation clusters, known as “systemic innovations”, generated by technologically and economically efficient innovation ecosystems. In turn, systemic innovations destabilize the socio-technical system, whose robustness depends on the strength of the routines (i.e., innovative behaviors) it generates.

Both the constancy and fluidity of systemic relationships between the transmitters and receivers of innovation determine the degree of complexity of innovation systems. These relationships are associated with a) the succession of integrated transformation operations,

separable and identifiable, but linked together by technological and organizational sequences (integration), b) commercial, financial, and informational flows between all stages of production and between users and suppliers (coordination), c) the strategy of players aiming for integrated and compatible valorization (synchronization/standardization) of innovations and ensuring the articulation of innovative activities (strategy). The diagram below illustrates the link between corporate and entrepreneurial strategy, the emergence and diffusion of systemic innovations, and the creation of complex, open innovation systems. It can be applied to organizations, sectors, industries, territories and countries. The ability to generate and spread innovations will attract financiers to invest in them (and often to speculate!).



Design : Hollman Rojas

An efficient innovation strategy (or policy), which aims to combine several operations whose different modes of action reinforce each other, is inseparable from nine main parameters, given the current extreme socialization of the forces of production:

- 1/ Stimulate entrepreneurship and creativity at every stage of the production process (from design to marketing!).
- 2/ Creativity is upstream of traditional R&D, but like R&D, it also irrigates the entire innovation process. It is based on imagination, in which innovative behavior plays a central role.
- 3/ The transition from general to inventive knowledge leads to knowledge management focused on the potentially innovative intellectual corpus (scientific paradigms).

4/ Today's challenge for companies is to develop dynamic capabilities, exemplified by knowledge capital, that enable the accumulation of specific organizational routines for controlling innovation trajectories.

5/ Organizational agility as a mode of collective (networked) realization of systemic innovations combines science, technology, skills, information, and flexible management of production resources.

6/ Collective inter-industry technological processes form relationships between technological and sectoral innovation systems. Cross-sector innovation systems (industries) combine over time through technology, depending on the strategic choices made by companies and the characteristics of institutional environments (e.g., innovation policies/incentives).

7/ The emergence of new global constraints (environmental, financial, commercial) and the formation of a new institutional framework are disrupting the contemporary technological system, leading to the selection and elimination of a whole range of "inappropriate" technologies.

8/ Innovation results from the accumulation of large volumes of information. In the context of *open data*, the information collected, exploited, protected, and valorized enables individual companies or networks of companies to fuel their agility and responsiveness to adapt to changes in their economic and institutional environment.

9/ In today's context of open innovation, platforms, and artificial intelligence, information risk calls for particularly skillful intellectual protection strategies.

In a nutshell...

In the classic network innovation model, the innovation strategy of the organization and the entrepreneur leads to the creation of an innovation ecosystem through an appropriation strategy to open up or access new markets.

In the open innovation model, innovation trends from a nodal innovation are linked to the implementation of strategies for integrating seemingly heterogeneous innovation ecosystems. This is the cause and result of the emergence and diffusion of systemic innovations.

To celebrate its 30th anniversary, *Innovations* will be consolidating its scientific base, focusing on the dialectical study of systems: the system as a source of innovation; innovation as a "product" of the system. The *Innovation 2025 Forum "Economics, management and engineering of innovation: trajectories and perspectives of systemic innovations"*, to be held in Paris from October 13 to 16 2025, will present the most recent advances in the fields of economics, management, and engineering, and the epistemology of systemic innovation.

*NB.* The editorial team would like to thank all the scientific, technical, and administrative colleagues who have contributed to the journal's development, and all those who have already committed themselves to the new and exciting adventure of *Innovations*.

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