
Evolution of the Concept of Innovation

“The ideas that shake the world
walk in the footsteps of doves”.

Friedrich Hegel

As has already been mentioned, the word innovation is, today, almost essential to any discussion or report about the economic, social and even political world. It seems obvious that innovation – the act of creating something new – has existed since the dawn of time and is a fundamental trait of human society. It can be likened to Bergson’s *élan vital* [BER 07], fueled by the constant dissatisfaction of man and his desire to do something different, i.e. to innovate. For example, the wheel was invented in around the fifth century BC in Sumer, Lower Mesopotamia, and many other innovations, such as the cuneiform alphabet and the production of soap, could also be cited. However, a glance at more recent history reveals that, strangely, the word has not been used; the term employed until the end of the 18th Century, and even during the 19th Century, was invention. Innovation was then the realm of unreliable adventurers and heretics [GOD 08], and was therefore rejected by society and the Church as a source of deviation. According to Kotsemir *et al.* [KOT 13], the authors of a piece of research into the historical evolution of the concept of innovation, partly

inspired by the work of Godin [GOD 08], the first pieces of work on innovation were undertaken in the field of sociology by Tarde [TAR 90]. Innovation was then considered to be a change in social constructs, such as language, law and religion. The word “innovation” seems to have been used for the first time in sociological literature by the American Hornell Hart in 1931 [KOT 13, p. 13]. More and more studies on innovation were then performed in the field of anthropology, sharing with sociology the perception of innovation as a process of paradigm shift at the societal level [KOT 13, p. 14]. They soon appeared in the field of economics, which initially focused on the technical aspect of the phenomenon, seeing in it a source of competitiveness growth through the development of new products, with Schumpeter [SCH 42] and his theory of creative destruction.

In its etymological sense, the term means “to change”, with the addition of the prefix “in”, suggesting inward movement, i.e. a kind of renewal. Today, the literature on the subject is abundant, and although the word can generally be understood as a way of organizing human activity around the development of something new, creating value, approaches to and attempts at definition are/have been manifold, depending on the various schools that have worked on defining the field. Our intention is not to produce a historical review, but simply to outline some major steps in the evolution of the concept, which, in our opinion, shape the meaning attributed to it at the beginning of the 21st Century, as the inevitable necessity of economic and social growth and deployment.

1.1. Major steps in the evolution of the concept of innovation

The concept became very popular in the 20th Century, and the golden age of work on innovation could be said to be the years 1960–1990 [KOT 13]. However, it nonetheless

remains contrasting and complex, with many aspects, depending on the viewpoint taken.

According to Schumpeter's interpretation [SCH 39], innovation is a technical change, a historical and irreversible transformation in methods. Technical progress is the lifeblood of economic development and is often deployed in a gradual spiral. To this end, he introduced the concept of "creative destruction": for example, the steam engine revolutionized production methods, causing a rupture, with a marked structural impact, paving the way for many other innovations [SCH 42]. He also highlighted the importance of the entrepreneur, the man of innovation, capable of a broad perspective and ready to shake up the tendency toward routine in order to produce innovations. This view tallies with current perspectives.

Drucker [DRU 85, p. 55] talks about a vector of change, a method through which entrepreneurs use changes as opportunities to establish/increase their competitive advantage. Porter [POR 90] gives the concept a collective, even national, dimension: innovation is not restricted to individuals, but affects and is influenced by its broader context. The industrial theory instead provides a linear analysis of technology as a factor of progress, i.e. innovation. The evolutionist theory focuses more on the history-dependent process of innovation, but also on the transformative capacity of the organization [GAR 94], and the constant evolution and irreversible nature of technological development [DOS 91, GAL 03]. The resource-based view of the firm tackles innovation by highlighting the importance of the company's internal resources, its information in a broader sense, as an internal dynamic and a source of competitive advantage [BAR 91]. Other authors, such as Wheatley [WHE 92], emphasize the dynamic role of information collected from new connections and new points of view from other disciplines and spaces, collegiate and

active networks, etc., in crystallizing innovation [WHE 92, p. 113]. These last three trends refer to the role of knowledge as a vector of innovation, in line with the current understanding explained in Chapter 2.

According to Wolfe [WOL 94], there are many theories of innovation, but, although they each have their value, they are confined to a particular perspective. Research efforts should focus on demonstrating the similarities between them [ABR 91, EVE 91, POO 89]. Wolfe suggests that this corpus be organized around three principal themes: (1) all aspects relating to the dissemination of innovation, (2) factors and dynamics that contribute to the capacity to innovate and (3) the elements and phases that constitute the process of innovation itself.

A different approach highlights the duality of the concept: is it a process or a result of this process? [QUI 11, AHM 10]. As a process, this notion represents the capacity to create value in a specific field, or even the actions undertaken to deploy innovation. As a result, this is a new idea [GUP 07, QUI 11] that embodies the added value in products, services, ideas or working methods [AHM 10].

These different viewpoints have been widely used and produce a range of understandings of the concept. However, they are based on three fundamental dimensions: novelty, application and value creation.

Novelty is essential to innovation. Barnett [BAR 53] defines innovation as any idea, process or thing that is new and qualitatively different from what already exists. But novelty is determined by the choice and perception of the said attribute by those who adopt it [TUS 99, ZAL 73]. Innovation is closely connected to this perception and how long it lasts [ROG 03, WAL 06]. This novelty is (or rather was, since the concept has broadened to include many other disciplines) usually in the domain of technology, but is

undeniably a driver of change in working methods and uses, underlying a certain structural reorganization [MÉT 12].

Another feature of innovation is its application, i.e. usefulness. Métissier [MÉT 12] says that innovation is an invention that has applications able to meet the real needs of mankind “by opening them up to what is possible”, which is still certainly far from predictable. The creation of an invention must be confirmed by use, exploitation and dissemination, creating value, in order to become “innovation” [O'SU 09, ROG 03]. Bélanger [BÉL 14] talks about transformation of the organization's human resources – such as knowledge – material resources and financial resources for the creation of goods and services with added value.

The consequence of these two traits is, of course, value creation, without which there is no innovation [O'SU 09, FRE 82]. The word value should be taken in the sense of added value, which, far from being exclusively economic, produces a bonus or advantage.

Indeed, innovation is practiced in all fields, from marketing to quality management, logistics, technology management, organizational behavior, production, strategy and economics, etc., with links still to be optimized between all these areas [HAU 06]. Likewise, it is used in many forms arising from the many meanings attributed to it: we speak of innovation of products, processes and strategies, social, administrative, managerial, philosophical and even political innovation. The other fundamental distinction sets radical innovation – the creation of something totally new – against incremental innovation – improving something that already exists (these two concepts will be explained in detail in Chapter 3). This opposition is all relative, since value depends on the context and the business model [CHR 97].

Rothwell [ROT 92, p. 73] maps out this evolution, emphasizing the dynamic nature of the innovation process by means of a diagram made up of five innovation generation models: the first model, before the second half of 1960, is linear and driven by a technological discovery that passes through applied research and becomes innovation. The second model, corresponding to the second half of 1960, is still linear, but this time driven by market demand. Then, around 1970, a sequential model appears, in which innovation is generated by the convergence of market needs and technical capacities. In the 1980s, the innovative process results from a cross-functional integration that unites the vertical and horizontal dimensions and brings together clients and providers, even the creation of strategic alliances and other contractual forms. The next decade saw the emergence of an innovation generation model characterized by the integration of systems and networking (network activities) with strong links with the stakeholders, a strategic integration, and even co-development. This analysis points to humans and potential participants as a focal point.

1.2. Paradigm shift

This transformation of the concept of innovation – requiring social adequacy and reliance on the human factor, the dynamic knowledge carrier – is tangible if we consider how the connotations of the following two OECD definitions have changed.

In 1981, the OECD report discussed the scientific, technical, commercial and financial steps necessary for the successful development and marketing of new or improved manufactured products and equipment, or even the introduction of a new approach for a social service, R&D being only one of these phases.

In 2009, it reported on the new nature of innovation, due to the radical transformation of society, which requires multidisciplinary skills and aptitudes and demands significant human resources, requiring organizations to evolve and adapt to the rapid changes in their environment in order to survive [OEC 09, p. 9].

Figure 1.1 illustrates this paradigm shift, which occurred during 1990–2000, marked by the extremely rapid development of new information and communications technologies, leading to the opening of the marketplace, which became global, and the change in the dominant value, i.e. intellectual capital.

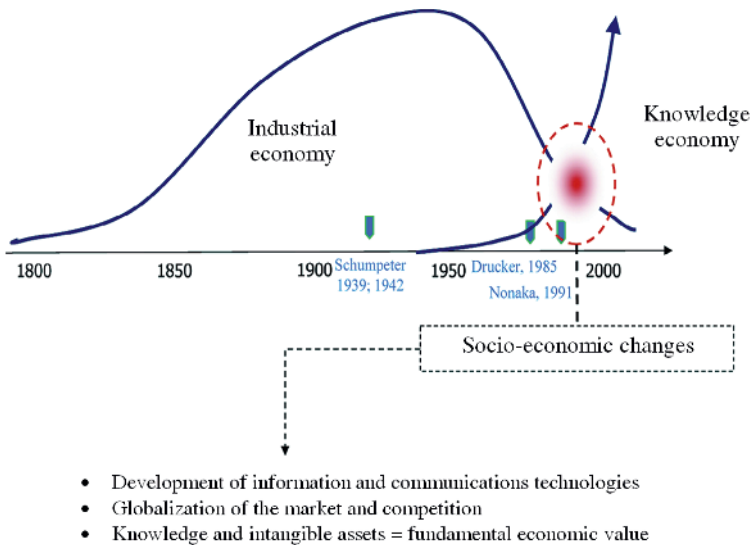


Figure 1.1. Paradigm shift in the years 1990–2000 [DES 01]

Indeed, several decades ago, society passed from the industrial age to the age of knowledge, marked by the recognition of knowledge as the essential element of organizational wealth [DRU 85]. Porter [POR 90]

emphasizes that the skills and knowledge contributed by human resources are perhaps the two most critical factors in increasing companies' competitive advantage, hence the natural emphasis on innovation as the principal driver of this growth.

Table 1.1, drawn from a comparative study of several theories, models and perspectives, some of which have been mentioned previously, summarizes the main changes that affect the concept of innovation [OEC 09].

	<i>Industrial age</i>	<i>Age of knowledge</i>
<i>Nature</i>	Technology is the driver Episodic, intermittent	The user is the driver Democratic and collaborative Interactive, repetitive, continuous
<i>Vision</i>	Centred on the company	Personalized, cocreated
<i>Aim</i>	Development of new products and services	New products, services, processes, practices, managerial concepts, thoughts and models, etc.
<i>Drivers</i>	Technology Competition The marketplace	Globalized challenges Social responsibility Technology seen as a facilitator
<i>Scope</i>	Closed, R&D laboratories	Democratization and opening
<i>Context</i>	Stability of rules	Rules of the game constantly changing/developing
<i>Model</i>	Linear, emphasis on R&D activities, technological research	Interactive: social and technical process; the company's capacity to innovate is strongly connected to its intellectual capital and the ability to use its knowledge

Table 1.1. *Comparative study of theories of innovation between the industrial age and the age of knowledge [CHA 13]*

In the age of knowledge, the phenomenon of innovation itself takes on another guise: unique and episodic, it becomes an interactive, repetitive and continuous process, which is no longer driven only by technological progress, but leaves the main role to the user. Its traditional perception, focused on and controlled by the company, is evolving into a more personalized and cocreative vision, in which the individual plays the central role [NID 09]. The concept of innovation has broadened its horizons, moving beyond the boundaries of technoscientific laboratories and becoming receptive to sociotechnical aspects, including human, social and organizational factors: it is applied to products and processes, but also to new services, business concepts and organizational processes, strategy and management practices. “There is now a greater recognition that novel ideas can transform any part of the value chain” [BIR 11, p. 43]. The balance between the traditional drivers – technology, competition and the marketplace – is upset, enabling the user to become the major player and technology the facilitator. Cocreation, the previously unused resources of the knowledge of users and external parties, and the quest for answers to global challenges and the problem of social responsibility are becoming dynamic vectors that trigger innovation [OEC 09]. Abandoning stability, the rules of the game are constantly changing as the context develops, shifting toward openness and democratization. Finally, innovation models have moved from linear to interactive, including social and technical processes based on the fact that an organization’s capacity for innovation is closely linked to its ability to use its knowledge resources [SUB 05, JOH 11].

These changes open up critical new avenues for business management and require significant adjustments in order to meet the demand to innovate and deploy adequate strategies to improve efficiency. These aspects will be explained in more detail in Chapter 2.

SOME KEY POINTS FROM THIS CHAPTER.–

– For Schumpeter [SCH 39], innovation is a technical change, a transformation in the *process*, and technical progress is the lifeblood of economic development.

– With the advent of the knowledge economy, innovation became the main source of value creation and competitive advantage.

– It is, in a way, democratized, extending to the company's entire value chain and involving all its stakeholders.

– Innovation is closely linked to the capacity to deploy and use the company's intellectual capital, putting into question the managerial approach of the traditional models.