
Thinking About the Meaning of Innovation

1.1. Introduction

The history of the concept of innovation is a fascinating one. It reveals that, contrary to popular belief, innovation has not always been viewed positively. Plato did not hesitate, in Book VII of *Laws*, to plead for tradition. Because innovation leads young people to despise what is old and to value what is new, it is, according to him, the worst of scourges for a *polis*, because it leads to instability. Ironically, “the same people who have challenged innovation for centuries – governments – are the same people who have de-challenged it, making innovation an instrument of economic policy” [GOD 14].

However, the massification of the production and consumption of innovations is nowadays questionable. What is the function of innovation in modern societies? What kinds of relationships does our modern society have with innovation? And more fundamentally, what innovations do we want for which societies?

In order to provide some answers to the above questions, this chapter invites us to think about the meaning of innovation. We will thus see that while the question of the meaning of innovation is an old question, over time it has been pushed into the background or even overshadowed by the question of the meaning of innovation for society. This observation will lead us to advocate for the reintegration of the meaning of innovation. The question then arises as to how to proceed. We will then present the *Penser le Sens de l'Innovation* (P.S.I.) approach (thinking about the meaning

of innovation), which emphasizes that the question of meaning must be considered from the points of view of both direction and signification.

1.2. Why bring up the question of meaning?

In a society where the injunction to innovate is a permanent one, it is legitimate to ask why it seems necessary to think about the meaning of innovation. To better understand our position, let us go back in time.

1.2.1. *The meaning of innovation: an old question*

1.2.1.1. *A positive view of innovation*

The question of meaning is not new. Starting in the late 16th Century, Bacon and Descartes associated the progress of knowledge with that of technology, and the progress of technology with the progressive improvement of the living conditions of people. Indeed, Descartes considers technological progress as the vector of the creation of a new “Garden of Eden” in which poverty, illness and even death can be excluded thanks to human genius:

As soon as I had acquired some general notions of physics, and as soon as I began to experience them in various specific difficult situations, I noticed how far they could lead, and how they differed from the principles hitherto used, I believed that I could not keep them hidden without sinning greatly against the law which obliges us to procure, as far as it is in us, the general good of all men. For they have shown me that it is possible to attain knowledge that is very useful for life... [DES 37, p. 168].

Specifically, Descartes advocates knowledge for action, with innovations being considered from the point of view of their contribution to the improvement of the living conditions of humanity:

This is not only to be desired for the invention of an infinity of artifices, which would make it possible to enjoy, without any difficulty, the fruits of the earth and the conveniences found in it, but mostly for the preservation of health [DES 37, p. 168].

According to Descartes, technological change is thus associated with the idea of progress through and for collective action. This vision of Progress, with a capital “P”, one might say, culminated in the Age of Enlightenment, a century

which claimed to be the time when Progress overcame backward-looking obscurantism. It was a century in which humans no longer experienced history passively but became the subject of this history, substituting God's place in the order of creation and participating in the design of the world in which they lived. It was a century in which faith in the capacity of humans to act, through reason, to make moral and social ideals concrete in the real world. The French Revolution of 1789 seemed to embody the revolution of Progress taking place. This led Claude-Henri de Rouvroy, Count of Saint-Simon, to affirm that the golden age of humanity was before them and not behind them.

History seems to agree with such a point of view, because the *Belle Époque*, a century later in France, ushered in a period of prosperity supported by the greatest wave of discoveries (vaccination, X-rays) and innovations (the construction of Gustave's Eiffel Tower, the birth of aviation with Clément Ader and the Orville and Wilbur Wright brothers, the birth of the film industry thanks to the invention of the cinematograph by the brothers Auguste and Louis Lumière, of the automobile industry following the invention and improvement of the combustion engine, the introduction of household electricity, etc.) in history. It was also a period marked by the advent of a new religion that Felix Le Dantec would describe as scientism¹ and the advent of the figure of the inventor as a modern-day hero, a figure that would be magnified by popular literature following the example of Jules Verne's writings in the 19th Century and truly global exhibitions such as the World's Fair.



Figure 1.1. Poster from the 1933 Chicago World's Fair whose motto was “Science finds, industry applies, man complies”. Source: Wikipedia.org. For a color version of this figure, see www.iste.co.uk/chouteau/innovation.zip

¹ Scientism is an ultra-enthusiastic attitude towards science, according to which science can do everything: it develops knowledge, is capable of solving all problems and ensures maximum happiness for mankind (“I believe in the future of Science: I believe that Science and Science alone will solve all questions that make sense” [LED 12, p. 55]) in an age when innovation is thought of as a pure product of science [FOR 17].

1.2.1.2. *A contested relationship to progress*

However, as early as the 18th Century, the question of limits was raised, of a progress beyond which we had as much to lose as to gain:

Is it necessary to wrest from nature all that can be obtained from it [...]? Is not everything else by chance the extravagance of the species [...], that is to say, a sure means of living miserably, taking too much care to be happy? [...] When nature has been defeated, the rest is just a display of triumph that costs us more than it gives back. [DID 29, p. 313]

In short, Diderot raises the question of the meaning of human action, of reasoned progress in the face of individuals, whether scientists or innovators, who do not necessarily master the powers that their minds give them.

While in the 19th Century there was growing suspicion of the relationship between technological progress, moral progress and the capacity of the latter to contribute to human happiness, World Wars I and II dealt a fatal blow to the very idea of progress when the most developed nations of the world clashed in a conflict in which technology played a key role and became its most deadly in the history of mankind².

By the middle of the 20th Century, the break with the idea of progress seemed to be complete. Many intellectuals questioned the lack of knowledge of the transformational power offered by innovations [WIE 59] and denounced the autonomous nature of technology which inevitably had unintended consequences [ELL 54].

Let us take a concrete example to illustrate the point of view of the philosopher Jacques Ellul. The first urban drainage systems spread to cities in the Middle Ages. The most widely used technique was that of “everything out in the street”³, leading to ill health, epidemics and pestilences. It was not until

2 We might agree here with the observation made by Thierry Ménéssier: “Before 1914, Westerners could believe that thanks to their scientific discoveries, their technical inventions and their political decisions, they were the subjects of history, this indefinite process within which their mastery and their happiness increased together. After this date, as Alain Finkielkraut suggests in an observation on the beginning of the twentieth century compared to the beginning of the previous century, history seems to be something to be endured” [MEN 11].

3 Literally, chamber pots were emptied through the windows directly into the streets!

1854 that engineer Eugène Belgrand, under the orders of Baron Haussmann, set up a sewer system to convey effluents to the Seine downstream. A remarkable advance for Paris, this solution actually only displaced pollution in the northwestern part of Paris and paved the way for water treatment techniques before returning it to the natural environment. These stations in turn led to new innovations aimed at reducing water pollution (linked to the presence of drug residues that were responsible for the appearance of sequentially hermaphroditic fish) or reducing electricity consumption.

The history of wastewater treatment thus reveals that technology creates as many problems as it solves and leads to a process of self-generation of technology in which people are now obliged to repair the damage caused by technology by means of new technical innovations which themselves create new problems [JON 90]⁴. There is in fact an empowerment of the technology creation process. However, this process can obscure the question of initial intentions and, in so doing, confuse the issue of the overall direction of modern society at a time when the long-term effect of technologies is increasingly unpredictable⁵.

1.2.2. *The illusion of meaning*

While the first half of the 20th Century sounded the death knell for the relationship established between innovation and progress, the second half of the 20th Century marked the advent of the relationship between innovation and economic progress and, more specifically, growth. However, as we will see, the advent of the era of the consumer society ushered in a period characterized by the illusion of meaning, or even the absence of it.

1.2.2.1. *From the meaning of innovation for society to the meaning of innovation for business*

During the period of the *Trente glorieuses*⁶ [FOU 79], most Western economies experienced exceptional growth. The latter was closely linked to

4 The author concludes that the technology behaves like “nature” which has “in some way become wild” [JON 90, p. 224] and should be domesticated.

5 This observation will lead Hans Jonas to plead for the elaboration of an ethics that is commensurate with the new modalities of human action.

6 Or the Glorious Thirty Years, which refers to a three-decade period that began with the reconstruction of post-war France in 1945.

the rise in labor productivity, which led to a fall in the real price of many products. By way of illustration, the price of a bicycle, expressed in terms of the working time of a laborer without professional qualifications, fell from 800 work-hours in 1900 to 110 work-hours in 1955 and 46 work-hours in 1972 [FOU 05, p. 486]. The price of a 2CV car fell from 3,088 work-hours in 1949 to 908 work-hours in 1983 [FOU 05, p. 476]. The fall in real prices was reflected in a significant increase in purchasing power and a clear evolution of the level of household equipment (see Figure 1.2).

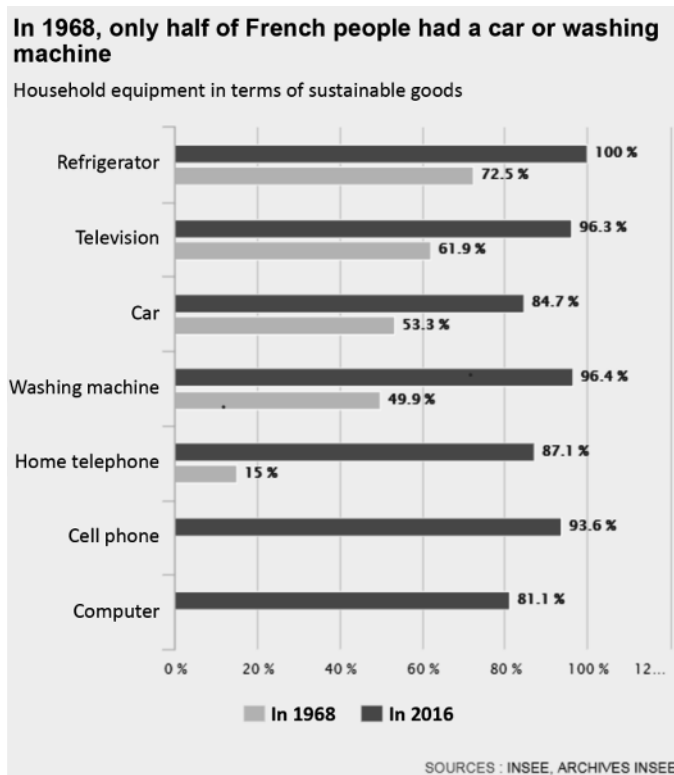


Figure 1.2. Trends in household appliance possession between 1968 and 2016 [DUR 18]. For a color version of this figure, see www.iste.co.uk/chouteau/innovation.zip

This was precisely where the problem lay. Indeed, at the end of World War II, households entered into an equipment race with durable goods that improved their comfort and freed up their time, such as small electrical appliances.



Figure 1.3. Moulinex and Hotpoint advertising from the 1950s. For a color version of this figure, see www.iste.co.uk/chouteau/innovation.zip

The corollary of this equipment race was an acceleration in the diffusion of innovations in society. For example, while it took almost a century for the telephone to be adopted by about 95% of the population, it took just 30 years for television to reach 50% of the population (Figure 1.4)⁷.

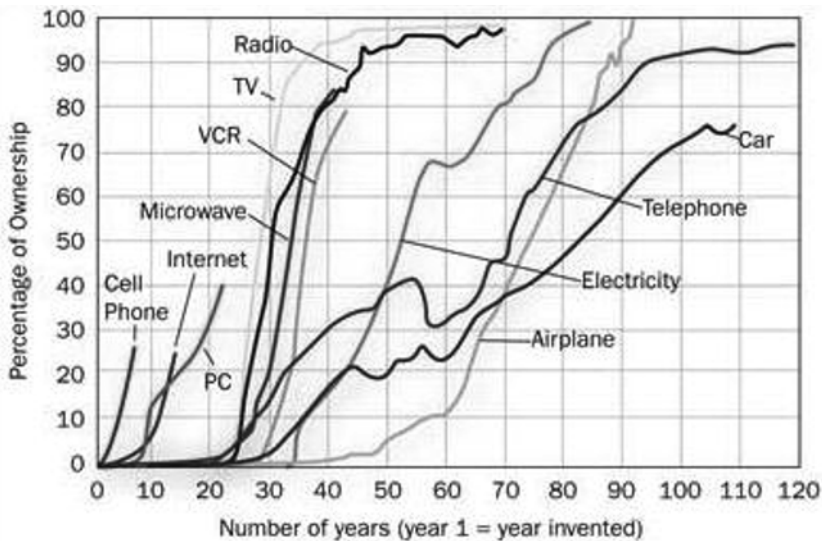


Figure 1.4. Technology adoption [BRI 97]. For a color version of this figure, see www.iste.co.uk/chouteau/innovation.zip

⁷ Note the acceleration in the rate of diffusion of innovations to the point of almost vertical curves since the 1990s, as was the case with television sets.

The equipment race also led to saturation in certain markets that were becoming renewal markets, such as that for television sets. Indeed, the latter, a victim of its own success, has many times been a saturated market. To boost sales, TV brands have been competing for decades to renew demand and offer increasingly sophisticated devices. This is a far cry from the first black and white TVs, where the picture was not always perfect (sometimes there was snow on the screen) and the user had to get up to change channels. Today, we surf with our remote control on the many channels of digital TV; we have replaced the cathode ray tubes by flatter plasma, LCD and OLED screens; the quality of the image and colors is constantly improving; QLED technology, the latest innovation in this field from Samsung, offers the brightest and sharpest image ever obtained to date, etc.

But one thing is clear: market saturation, coupled with increased competition, is now forcing many companies to simply innovate to maintain their positions. This is an example of the famous paradox of the Red Queen⁸ by biologist Leigh Van Valen. Transposed to the scale of companies, the Red Queen paradox helps us understand how competition forces companies to innovate constantly in order to stand out and gain a competitive advantage over competitors who, at the same time, adopt the same behavior so as not to see their own market position deteriorate.

The race for innovation that Samsung (Galaxy) and Apple (iPhone) have been engaged in for years is emblematic of this paradox, which is itself largely maintained by hard-hitting advertising campaigns. We remember, for example, the 2013 Samsung ad which “trolled” the size of the 4-inch screen of the iPhone 5 and 5S. This led Apple to respond in 2014 with a 4.7-inch model. In 2016, Apple again had to give in to competitive pressure by making its iPhone 7 waterproof following Samsung’s 2015 advertising campaign featuring an iPhone 6 user plunging his smartphone into a bowl of rice in an attempt to save it because, unlike Samsung’s Galaxy line, it was not waterproof!

The above example is instructive because it helps us to understand that innovation, whatever its nature, has changed its status over time. In the majority of cases, it is no longer a goal in itself but a question and a means

⁸ This paradox takes up the hypothesis of Van Valen’s Red Queen: the ongoing evolution of a species is necessary to maintain its aptitude following the evolution of the species with which it co-evolves.

of survival that leads to a “massification of the production” of incremental innovations⁹ with a return on investment which is often disappointing:

Red Queen competition describes competitive rivalry in which firms must increase their investment in order to maintain their existing market position while at the same time failing to earn returns that are commensurate with higher investments [LAM 05, p. 4].

To put it another way, innovation, in the majority of cases, is no longer considered a project in the service of the society but as an end in itself intended to anticipate the offers of potential or existing competitors. But this statement does not end with the case of renewal markets. The relationship established between innovation and growth has over time brought to the forefront the strategic meaning of innovation for the company, leaving in the shadows the question of the meaning and that of the relationship we have with these innovations.

We are indeed witnessing a shift from a reflection on the meaning of innovation to a reflection on the meaning of innovation for the company, which is quite different. To put it another way, “innovation does not tie technological inventions and organizational rationalization to a social and moral purpose, as was done in the theme of progress” [MEN 11, p. 17]. It is in the same spirit that the words of the philosopher Eric Sadin should be heard when he accuses the President of the Republic of “bowing and scraping” before the CEO of Withings, a company at the cutting edge of connected objects [KYR 16]. The author criticizes in hollow that the economic imperative takes precedence over the meaning of these connected objects. He believes, for example, that the use of connected wrist devices or scales, as well as Big Data, generates behaviors that deserve to be analyzed for what they say about our relationship to the body (ongoing measurement, etc.) or to our free will. This statement is all the more worrying since the shift from thinking about the meaning of innovation to thinking about the meaning of innovation for the company seems to go hand in hand with the idea that everything that is new would necessarily be profitable for us!

⁹ Objectively, do we really need a deodorant with proven effectiveness for 72 hours? Is not this the symptom of companies trapped by the permanent innovation syndrome and subjected to the imperative to innovate even if it means proposing useless innovations and gadgets?

1.2.2.2. *The paradox of happiness*

The illusion of the meaning of innovation is also noticeable on the consumer side. The consumption of innovation has now become a routine. Indeed, while innovation used to be exceptional, it is now expected and has become a “mass product”. The MediaCom study of September 10, 2015 reveals that 73% of French people make innovation a real purchasing criterion [MED 15]¹⁰, and underlines that innovation is desired by more than one target group¹¹. Innovation attracts the vast majority of French people, regardless of their age (16–24 years: 91%, 50–65 years: 76%), sex (men: 82%, women: 81%) or socio-professional (CSP) status (inactive: 78%, CSP+: 85%).

This appetite for innovation is related to the fact that innovation is spontaneously associated with expected benefits, whether these benefits are

- functional: the innovation simplifies daily life, saves time, etc.;
- hedonistic: the innovation contributes to immediate satisfaction; it gives new magic to daily life by giving us new personal experiences;
- symbolic: the innovation contributes to making visible my identity, my belonging to communities, etc.

But more fundamentally, the idea that the increase in the consumption of innovations goes hand in hand with the increase in our well-being¹², as if our

10 Remember that the appetite for novelty leads to the purchase of products (TVs, smartphones, etc.), while those we own still work. At a time when more and more consumers are outraged by the industrial strategy known as “planned obsolescence” (the batteries in our smartphones are designed to last 300–400 charge cycles and our washing machines are programmed to break down after 2,000–2,500 washing cycles (European Consumer Centre, 2013)), what should we think of planned obsolescence caused by the consumer?

11 This corroborates the results obtained by a study led by Lab42, according to which “84% of respondents say it is somewhat or very important that the company they buy from is innovative” (New study reveals importance of innovation to consumers, July 17, 2015, <http://customerthink.com/new-study-reveals-importance-of-innovation-to-consumers/>).

12 It can be assumed that this relationship was partially true in the early “glorious thirties”. Does it still play today among the humblest consumers? This is highly doubtful, since an innovation sometimes acts as a decoy that, with a great deal of publicity, leads consumers to sacrifice basic needs (e.g. healthy eating) to the consumption of new objects (smartphone, TV subscriptions, etc.) or to act in an even more extreme manner.

happiness depends solely on the quantity of objects we possess or experiences we have had, is behind the innovation addiction¹³.

However, the correlation established between innovation and happiness is an illusion. The richest people, who, technically speaking, are able to consume the most innovations, are not necessarily the happiest. There are several reasons for this:

- the first acknowledges the ephemeral nature of the feeling of happiness associated with possession. Once acquired, the object quickly becomes ordinary and the bubble of happiness bursts;

- the second is our inability to be satisfied with what we have (we often behave like spoiled children and always want more);

- the third is related to the comparison effect. The rapid diffusion of innovations contributes to their democratization and thus reduces the conspicuous character attributed to them by wealthier consumers. Conversely, innovation produces frustration among the most disadvantaged who cannot access this new standard;

- finally, happiness cannot be reduced to the number of assets acquired; “it includes such intangible and subjective elements as feelings of belonging, justice, physical and social security, family development ...” [BLO 10, p. 320].

Taking into account the unsustainable nature of the happiness offered by the consumption of innovations, coupled with the fact that a consumer society is now more concerned with stimulating the desire to buy than with providing individuals with “useful” consumption¹⁴, in a context increasingly marked by the question of the growing pressure on our environment, updates the question of the meaning of innovation.

1.2.2.3. *In search of lost meaning*

It will be understood that, with the era of the consumer society, innovation has become dissociated from the idea of Progress, and thus from the reflection on the meaning of society that these innovations help

¹³ What about the fact that a middle-class household in the United States today owns about 300,000 items? [MAC 14].

¹⁴ Many purchases are not essential (we can live without them) but respond to a desire largely generated by advertising, which today no longer boasts the satisfaction of needs but of desires.

to conceive. This dissociation was made all the easier by the fact that the massification of the production and consumption of innovations seemed to generate meaning, meaning that led to obscuring the eminently political question of which innovations we want for which society¹⁵.

Fortunately, since the end of the 20th Century, more and more voices have been raised to denounce this lack of meaning and plead for a new way forward. Indeed, do we need to own one or even two private cars per family when a car is stationary on average 92% of the time? Is it really necessary for American homes to have more televisions than there are people [USA 06]¹⁶?

To put it another way, our society does not expect innovation but progress; it does not always demand more innovation but wants well-being¹⁷. This idea is clearly perceptible in the study *Innology, baromètre de l'innovation* carried out by the Iligo Agency and the Reload Consulting and Training Firm in 2017. According to the latter, the ideal function of an innovation is the preservation of natural resources (63%) [ILI 17]¹⁸.

However, we must be wary of reducing the question of the meaning of innovation solely to the concerns arising from the advent of ecological awareness. It is a matter of acknowledging that the question of the meaning of innovation is much broader and concerns all innovations designed by humans. Because, as Tristan Harris, Google's former "product philosopher", deplures, in referring to the relationship we have with our smartphone, Silicon Valley companies push us to spend as much time as possible on their interfaces (what he calls "captology"), and paradoxically "millions of hours are just stolen from people's lives and there is not a single public debate about it"¹⁹.

15 Can we not hypothesize that this lack of meaning is not unrelated to the increase in inequalities, the decline in solidarity, etc.?

16 French households had an average of 5.5 screens per household in 2017 (since households would no longer only consume audiovisual content from their TV set, but also on their telephone, tablet or computer).

17 Note that this finding is limited neither to mass consumer goods nor to product innovations. It is valid for all types of innovations.

18 It should be noted that the ideal function of an innovation for tomorrow relates to the collective rather than the individual.

19 Likewise, we have never been more connected, yet loneliness and isolation are constantly on the rise.

It should also be stressed that, while we can only welcome the dissemination of the precepts of sustainable development within our society²⁰, it is nevertheless necessary to think about the meaning of the proposed directions. The production of solar, wind or any “renewable” energy requires the use of rare minerals found in electric car batteries, X-ray machines or smartphone chips, which, in addition to being rare, are non-renewable, so that an innovation deemed responsible in its purpose may have a catastrophic ecological footprint or be carried out under deplorable working conditions [PAV 18, p. 167]. Similarly, it is necessary to question the tendency of our societies to think about the environment through the prism of recycling.

Let there be no misunderstanding about the meaning of what we are saying; it is neither a question of minimizing the ecological emergency situation in which our societies find themselves, nor of denying the benefits of this reflection, as they are palpable as evidenced by the reduction in the use of materials per unit manufactured and in the consumption of energy when using products, the replacement of polluting raw materials, etc. More modestly, it is a question of collectively questioning the meaning of this direction²¹. Does it not lead to maintaining, if not reinforcing, the process of massification of the production and consumption of innovations mentioned above? As Romain Debref points out, based on the work of Nicholas Georgescu-Roegen:

Innovations that are considered environmental may well belong to, and reinforce, the era of Prometheus II rather than providing a transition to another form of development. Some projects based on a circular economic logic reflect this situation [DEB 16].

Similarly, we know that the sustainable urban factory does not benefit everyone equally, as it generally leads to higher land prices, which can contribute to socio-spatial segregation. Therefore, the P.S.I. approach invites us to make the sustainable city a political question: what do we decide to do with eco-neighborhoods or in order to reduce socio-spatial segregation?

20 While the Brundtland Report of 1987 contributed to the popularization of the concept of sustainable development, the premises of this ideology had already been put forth in the 19th Century in the work of G. Perkins Marsh in 1964 and in the report *Halte à la croissance* [MEA 72].

21 It should be noted, however, that many studies emphasize that it is the ecological cost of the entire life cycle of green technologies that should be measured and not that of the finished products alone [PIT 18].

In short, it must be stressed that the environmental question cannot replace the question of the meaning of innovation and that it is urgent to reintegrate the question of the political meaning of innovation (understood in the primary meaning of “what concerns the citizen”), which is too often hidden behind a purely technical conception of the problems [FOR 15, p. 15].

1.3. The P.S.I. approach (*Penser le Sens de l'Innovation*)

If one accepts the idea that the question of the meaning of innovation needs to be re-examined, the next question that arises is how to proceed. It is precisely this question that this section will answer, which will show that the question of meaning must be considered from the points of view of both direction and signification.

1.3.1. *The question of meaning considered from the point of view of direction and signification*

What do we mean by a dual point of view? To understand these two points of view, let us use an analogy.

When we look at a tree, we see that it is made up of a trunk from which multiple branches grow. Each branch corresponds to a direction of development. It is not alien to the environment in which it develops. Everybody knows that plants grow towards the light, a phenomenon called phototropism. So, if at the edge of a forest or near a building, trees are tilted towards the light, it is not because they are attracted by the light but because the branches on the forest side, having less light, grow slower. However, the direction taken is not neutral. The tree, being heavier on the lighted side, will, for example, bend to this side. Likewise, it will have less fruit on the shadier side.



The genesis of innovations resembles the development of a tree (see Figure 1.5). The trunk represents, starting from a defined problem, the meaning of innovation projected by the designer (safety, autonomy, user-friendliness, durability, etc.). The branches represent alternative solution principles (concepts), with each principle corresponding to a possible direction. The plurality of possible directions is reminiscent of a characteristic of the design process that there is no single solution to a design problem. It should also be pointed out that these are not only technological²² or high-tech²³. These directions are not independent of the environment in which they operate, whether we consider the state of scientific and technological knowledge available, the company's own skills²⁴, or the representations or technological orientations favored in the framework of public policies²⁵. The deployment of a direction depends on the capacity of the concept imagined to generate meaning for the user, the meaning perceived by the user being a function of the value creation, itself a function of the meanings of product in use, that is, the capacity of innovation to be integrated into the practices, representations and values of future users²⁶. Finally, these directions do not all have the same signification for society (relationship to freedom, the principle of universality, etc.) and can open up new directions and new fields of what is possible (the case of direction 1 in Figure 1.5)²⁷. We also perceive that if the direction does not generate meaning (for the user and/or the society), it will not be able to spread (as in the case of direction 3 in Figure 1.5).

22 For example, the question of urban security can be answered by video surveillance, community policing or the development of an associative coalition with a socio-educational and inclusive aim.

23 Frugal innovations are a perfect illustration.

24 A company that makes sensors will naturally tend to propose solutions linked to the technology it controls.

25 The spread of hygienist theses in the mid-19th Century had a major impact on the design of cities. The same applies to the definition of technological priorities (which was the case of nanotechnologies under the presidency of Nicolas Sarkozy; today, it is artificial intelligence).

26 We will go into more detail on the question of the meanings of product in use in Chapter 3.

27 The effects of filiation are thus highlighted.

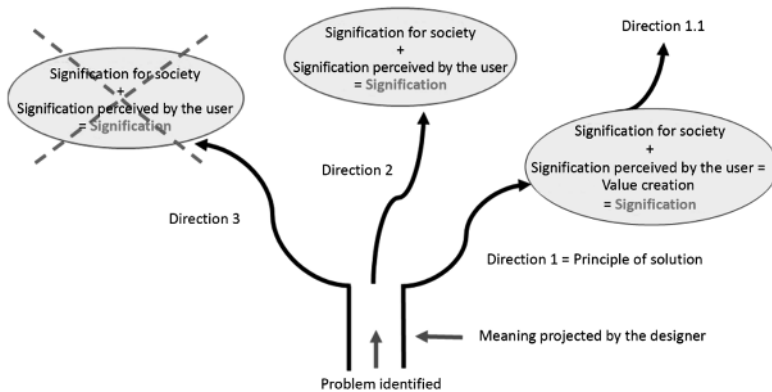


Figure 1.5. *Innovation meaning tree. For a color version of this figure, see www.iste.co.uk/chouteau/innovation.zip*

In order to make our point clearer, here are two concrete examples. The first concerns the aging of the population and more specifically the issue of the loss of autonomy of the elderly in a context where, to take the case of France, 83% of French people wish to age in their own homes [CSA 16]. This is precisely the initial problem to be solved. On the designer side, the projected meaning of home care for the elderly corresponds to the right of the elderly person to remain at home and goes hand in hand with the idea of independence, well-being and security. It is in this context that the idea of the connected home emerged. A number of projects have indeed seen the possibility of proposing a new direction in the development of sensors and their price reduction. The principle is simple: sensors, when placed in different rooms of the house, make it possible to collect the movements of the elderly (how many times the refrigerator has been opened, the television turned on, etc.) and to warn a relative in case of unusual activity. In other words, the sensors become a kind of “prosthesis”, allowing relatives to know whether the elderly person is well and to “monitor” him or her. However, there are two questions that arise from this monitoring. The first issue is respect for the privacy of the elderly person who is potentially spied on in his or her every move in the home on a daily basis. To what extent does such a project harm the freedom of the elderly person? In other words, does a more controlled society not lead to less freedom²⁸? The second issue is

²⁸ A total of 44% of respondents in the CSA survey (2016) consider the connected home as “a threat to individual freedoms”.

related to that of isolation. At a time when there is continual talk about the growing isolation of the elderly, does not this system lead to increasing it? Would such a system not reduce the number of visits to the elderly or the number of phone calls made to relatives to be sure they are well? Is this type of practice consistent with the values of our current and future society? Is our ideal society one in which we relegate to machines the task of asking how our loved ones are doing?²⁹

The direction chosen, beyond the creation of value promised to the user, raises the broader question of the meaning of the society we help to create. While it is nowadays commonly accepted that an innovation is always the result of compromises made during the design process (compromises between functions to meet specifications³⁰ and between stakeholders³¹), it should not be forgotten that it is also meaningful for the society it helps to design. Thus, while the concept of the connected home goes hand in hand with “sensor-surveillance”, which we have suggested can lead to a loosening of social ties, the *Veiller sur mes parents*³² project (launched by the French Post Office on May 22, 2017) is intended, according to Philippe Wahl, CEO of the La Poste group, “to relieve carers in their tasks, reassure families, and improve the well-being and safety of senior citizens.” Transformed into a sentinel for the elderly, the postman reinforces the social bond by instituting weekly visits, while some postal workers denounce what we might call the commodification of the social bond.

29 Overall, 47% of French people believe that the connected home “dehumanizes relationships” [CSA 16].

30 This is not a new idea; it was first posed by Herbert A. Simon: “For example, the criterion for a new automobile design may require that it can be manufactured at less than a specified cost, that its gasoline consumption be less than a specified amount per mile, that it exhausts gases meet legal standards for emissions, that it incorporates safety belts, that it have a ‘streamlined’ appearance and chrome hubcaps, and so on. The list can be as long as we please, and there is no need to specify how much one of these requirements would be traded off for a given improvement in another. All have to be satisfied in a satisfactory design” [SIM 92, p. 30].

31 It should be noted that this compromise depends on the knowledge and technologies available at time “t”. It should also be remembered that the good designer, or the ideal designer, is not the one who seeks to express his ability in perfection, but functional adjustment [FOR 03].

32 Watch over my parents.

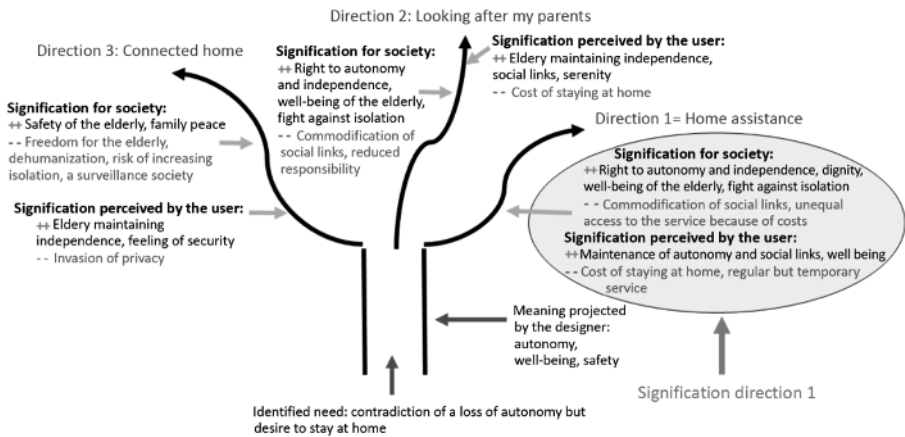


Figure 1.6. The innovation meaning tree as a decision tree. For a color version of this figure, see www.iste.co.uk/chouteau/innovation.zip

A second example is *in vitro* fertilization (IVF). The first IVF child, Louise Brown, was born on July 25, 1978, at Oldham Hospital in England. In spite of the many controversies surrounding it (whether we think of the debate on the risk of eugenics or the mass destruction of embryos), this innovation has been widely disseminated (it is estimated that it is responsible for more than 8 million births in 40 years) because it allows infertile couples to become parents. While IVF may be a challenge to the natural order of things, on the user side, it responds to the desire to become a parent. From the point of view of society, it goes in the direction of a society that places equity as a fundamental principle of our life in society, which led to the recognition of medically assisted procreation as a right at the 1994 Cairo conference³³.

It is clear that the choice of direction must have meaning both for the user and for the society in which the innovation will be deployed. This meaning is all the more necessary as the direction chosen opens up the field of possibilities for future innovations, thus giving rise to lines of innovation. For example, IVF has paved the way for new directions of innovation.

³³ It should be noted that this innovation also upsets our categories of thought because it questions the concept of mother which is now “split” between genetic mothers, surrogate mothers and institutional mothers.

Thus, on January 26, 2011, Umut was born, the first “medicine baby” in France, designed to treat his sister suffering from severe beta-thalassaemia³⁴. Umut was the result of IVF followed by the selection of healthy embryos that were compatible with his older sister’s immune system. While the value attributed to this innovation by the parents was to enable the survival of their child, the meaning at the level of society is again based on the principle of equity (that of being in good health) and raises the question of its financial support³⁵. It also raises the question of a necessary discussion on the preferred direction because, as Dr. Julie Steffann, a geneticist at the Necker Hospital in Paris, pointed out, this new direction leads to “prioritizing the embryo rather than the sick child”. This innovation also raises the question of the society we help to make: is not the very name “medicine baby” symptomatic of a change in value? In addition, does not the birth of the first two GMO babies³⁶ in November 2018 in China force us to question ourselves collectively lest we run the risk that what is possible exceeds the desirable and we fall victim to the warnings of the physicist Dennis Gabor³⁷? What could be the meaning of “off-the-shelf conception” of an unborn child? Is it to be seen as the symbol of an entire society oriented towards perfection, without error? To what extent does this growing artificialization of mankind guarantee us the possibility for all human beings – the “augmented” and the “others” – of always forming the same humanity, in solidarity and equal in dignity and rights? Finally, what about a society in which it seems easier to give up one’s genetic heritage than one’s material heritage³⁸?

34 Severe beta-thalassemia is a disease due to the failure of the hemoglobin gene characterized by severe anemia.

35 Incidentally, it raises the question of what can be taken care of collectively and the underlying hierarchies. What about the fact that, in France, IVF is 100% covered and that a single-focus clear optical glass with a sphere between -6.00 and +6.00 is only reimbursed at 2.29 euros? The risk of creating injustice in the name of the principle of equity is looming large because the cost of care is increasingly becoming an excessive burden for the poorest populations.

36 In this case, just after injecting the husband’s sperm into the egg, an embryologist injected a Crispr-Cas9 protein that modifies a gene to protect little girls from future HIV infection.

37 This fear was first articulated several years ago by Jacques Testart, one of the two key players in the birth of the first French test-tube baby.

38 Does not the renunciation of the former open the way for the future renunciation of the latter?

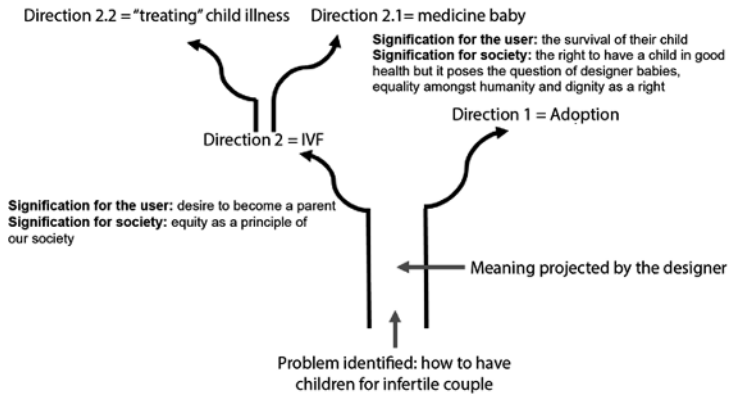


Figure 1.7. *Line of innovations*

Clearly, the P.S.I. approach urges us to reintegrate the question of the meaning of innovation. Moreover, it argues that the signification of the proposed direction must be considered from the point of view of the user and society. Indeed, an innovation that makes sense for the user must also be “good” or “useful” from a society-wide perspective.

1.3.2. *The P.S.I. approach: a philosophy of and for action*

Reintegrating the political innovation issue is precisely what distinguishes the P.S.I. approach from Design Thinking³⁹.

Although Herbert Simon, by defining design as “a way of thinking”, was no stranger to the advent of Design Thinking, it was not until 1987 that the concept appeared for the first time in Peter Rowe’s book *Design Thinking* [ROW 87], and the design agency IDEO formalized Design Thinking as an innovation process with specific steps, methodology and tools at the beginning of the 1990s. As Tim Brown, designer and IDEO president for 19 years, points out, “IDEO did not invent design thinking, but we have become known for practicing it and applying it to solving problems small and large” [BRO, no date]⁴⁰.

³⁹ In reality, the P.S.I. approach is more an extension of than an opposition to Design Thinking, as we will see in the following chapters.

⁴⁰ This was taken from the IDEO website: <https://designthinking.ideo.com/>.

Defined as a “methodology that imbues the full spectrum of innovation activities with a human centered design ethos” [BRO 08, p. 86], Design Thinking aims to match the user’s expectations with technical feasibility and economic viability and proposes a reversal of perspective: “rather than asking designers to make an already developed idea more attractive to consumers, companies are asking them to create ideas that better meet consumers’ needs and desires” [BRO 08, p. 86].

However, because Design Thinking is user-centered, this leaves the question of meaning for society in the shadows, contrary to the P.S.I. approach, which obliges us to think about meanings for the user and for society. The P.S.I. approach takes into account the fact that the designer’s action is not neutral. On this basis, it aims to make the designer aware of the solutions he/she is planning and to question the meaning of the society he/she is helping to create⁴¹.

In other words, it means breaking with a concept inherited from Greek thought of a split between the “man who thinks” and the *homo faber* (the one who makes), a conception that is no doubt related to the fact that we have gradually forgotten that the world of the artificial [SIM 69] is a bearer of meaning and values and that designers, in bringing about innovations, participate in the design of our future world. In our opinion, it is precisely this question that must be reintegrated into the design process if we wish to avoid the profusion of gadget innovations (barely created and already obsolete), avoid false good ideas⁴² and reduce planned obsolescence, and provide answers that are not only technical and/or technocratic to the great challenges of our time.

Let us make no mistake about what we are discussing now. The P.S.I. approach is not intended to be an overbearing and moralizing discourse that would consist of making an ex post value judgment on such and such an innovation. To put it another way, the P.S.I. approach does not oppose authority to this or that innovation, it aims more modestly to reconnect, through the innovation project, with debates relating to the society we

41 According to a concerted plan and not just because of what technology allows us to do.

42 The example of straws can be mentioned here as an illustration. Recyclable and reusable straws were born out of the realization that every day 1 billion non-recyclable straws are thrown away worldwide, including nearly 9 million in France in fast food restaurants alone. But should not a real sensitivity to environmental issues invite us, in order to stop wasting straws, to stop drinking through straws rather than creating recyclable straws?

conceive and within which we are evolving. Thus, the P.S.I. approach appears as a philosophy of action⁴³, because action is the fact of acting, of doing something that makes sense and that goes in one direction, and a philosophy for action to innovate – philosophy for action because it engages the question of meaning in the very process of design that allows us to innovate with consciousness.

The P.S.I. approach is also not aimed at integrating fear as part of the design process to innovate with consciousness. Indeed, we live in an era marked by an ambient catastrophism based on the production of a narrative of danger. The latter is largely imbued with hyperbolic discourse (“catastrophes”, “threats”, “plagues”, etc.) and a dramatic tension staging an apocalyptic scenario in the absence of action, following the example of the collapsology theory. The latter, which is defined as the study of the collapse of industrial civilization, in fact mobilizes the narrative of danger to emphasize that the dynamics of our society are inevitably leading to a collapse for which we must prepare ourselves, and that utopia lies in the minds of those who believe that everything can continue as before. The fatalistic conception of collapsology breaks, however, with the words of Jean-Pierre Dupuy who, in his book *Pour un catastrophisme éclairé*, proposed to give credence to the image of a future sufficiently catastrophic to be repulsive and sufficiently credible to trigger the actions that would prevent its realization [DUP 02] because this “heuristic of fear” (Jonas) acts as the developing bath (in the photographic meaning of the term) of what is of incomparable value to us⁴⁴ and avoids, contrary to the precautionary principle, sticking to probabilistic risk management where disaster should be anticipated [DUP 02].

The P.S.I. approach is not based on this ambient catastrophism which, apart from the fact that it is likely to have a paralyzing effect and lead to immobility⁴⁵, would lead, according to Dominique Lecourt and Jean-Claude Seys, to

a low morale of sobriety and frugality which is nothing but
a fearful retreat in the face of an opportunity to be seized. Is it

43 To be more precise, it is a philosophy of the design process.

44 According to the author, it is in the anticipation of the threat, or in the apprehension of the loss, that we discover the value of what we are going to lose.

45 For those who fear their own fears are incapable of facing uncertainties.

not now time when “aware of the risks [...] we are fortunate enough to be able and obliged to restore the meaning to progress? It is an opportunity, because without a sense of progress there is no humanity worthwhile.” [LEC 10]

The P.S.I. approach is based on a political heuristic that invites us to think about the meaning of what we conceive and, through it, the meaning of our humanity. It thus has an active scope and is oriented towards the future⁴⁶. However, while the scope of the heuristic of fear is turned towards the question of the preservation of our humanity⁴⁷, the P.S.I. approach invites us to question in each innovation the values we wish to defend, whether they are directly linked to our survival⁴⁸ or not. This allows us, for example, to ask ourselves what a truly human life is and, to return to the example mentioned above, to accept the flaws of not being perfect. It also means questioning the modern trend of awards. To encourage users to sort their recyclables, some stores give discount coupons to customers who bring back their plastic bottles. What kind of society are we building by going in that direction? Is not the implementation of such a system in opposition to altruism, which seems to be a key element of living together? In the same vein, what about the gamification of the world and nudges that consist of inciting action not through education but through play and reward? Is not there a risk of infantilizing people or even making them anxious by setting goals they may not be able to achieve?

Instead of being paralyzing, the P.S.I. approach invites debate on the world we are designing⁴⁹. But this debate is not merely the prerogative of

46 The horizon is the same as that of Hans Jonas’s heuristic of fear, for whom we must emancipate ourselves from the concept of responsibility conceived *ex post* with regard to effective action (of what has been done) in favor of a conception of responsibility that proceeds from the future (from the power to do).

47 “Act in such a way that the effects of your action are compatible with the permanence of a truly human life on earth” [JON 90, p. 30]; “never should the existence or essence of man as a whole be put at stake in the bets of action” [JON 90, p. 62].

48 Xavier Pavie wonders about the meaning of this “sickly anthropocentrism” because, according to him, the fundamental question is that of the amputation of all forms of life due to the impact of anthropic activities (2018).

49 A debate that could enable us to move from a compromise between the points of view held by the various stakeholders to a compromise on the risks that we are collectively prepared to assume, and that is emancipated from the logic of consultation understood as a process of adjusting divergent interests in favor of that of co-design.

politicians and scientists who are considered the only ones with intellectual resources for debate. Because it takes place during the design process itself, the question of the meaning of innovation engages designers and all stakeholders in the design process. In so doing, it participates in the advent of a “technical democracy” [CHO 15; LEQ 15] that shapes our world instead of being condemned to live in a world we were never asked if we wanted. Therefore, it contributes to emancipating itself from the paradigm of social acceptability which too often leads to considering users as “deviant” actors who need to be controlled, rather than as bearers of another rationality whose meaning needs to be understood⁵⁰.

P.S.I. approach	Criteria	Jonas’ conception
Innovating with conscience	Basis for action	Principle of responsibility
Political heuristics	Underlying heuristics	Heuristics of fear
Thinking about the meaning of what we design and, through it, our humanity	Function of heuristics	Ensuring the survival of humanity
During the design process	Questioning time	Ex post statement: the fact that a technique is potentially dangerous must lead to its suspension, because the irreversible nature of the consequences “forbids playing dice”
Strength of proposals	Nature of requirements	Force of restrictions or even prohibitions
Technical democracy (designers, users, institutions, etc.)	Key player	Elitism in favor of committees of wise men (a benevolent dictatorship)

Figure 1.8. *Putting the P.S.I. and Jonassian approaches into perspective*

The P.S.I approach having been presented as a philosophy for action, the question now arises as to how to implement it. Therefore, the following chapters offer some answers to allow us to innovate with consciousness.

⁵⁰ It also invites us to rethink the training of engineers so that they are not mere operators in the process of massification of the production of innovations but the vectors of conscious innovation-action.

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