White Paper

A Brief Study on Overcoming the 10 Major Innovation Pitfalls

Editions d'Innovation

This white paper provides an overview of failures in innovation and aims to present the extent of this phenomenon, the challenges it raises, its frequent causes and, above all, possible solutions to overcome it. It draws upon recent studies and statistics published by innovation experts and specialized institutes.

CHAPTER ONE

INNOVATION: WHAT IS IT AND WHAT IS AT STAKE?

What is innovation?

Today, innovation concerns all areas of activity. The Oslo Manual [1] distinguishes between four forms of innovation: product innovation (goods and services), process innovation, organizational innovation and marketing innovation. It also specifies that this term encompasses several phases beyond R&D: late development phases, pre-production, production and distribution, etc. Moreover, innovation processes can vary greatly from one sector to another; some of them are characterized by rapid and radical changes, while others are more conducive to innovations that are less disruptive and more incremental.

We can also speak of social innovation that has begun to take off in recent years and whose objective is to improve the well-being of individuals and communities. It can be a form of rupture from the solutions that are usually implemented, and it provides a creative response to economic and social problems that are not addressed by public institutions or markets. Similarly, environmental innovations[a] – or eco-innovations – can be at the heart of sustainable development strategies. They can lead to new modes of production and to a transition to new economic models, including those inspired by circular economy logics.

Any kind of innovation is by nature complex and inevitable. It requires multiple skills and expertise at all stages of its process and is a necessity both for society in general and for companies, as part of a process of value creation.

Innovation is a broad field. Although most of the comments and recommendations made in this white paper apply to all contexts and fields of innovation, our comments will focus particularly on companies, start-ups and innovative project owners.

a New processes, products, techniques and organizational methods that are compatible with an ecological approach

The challenges of innovation

France now shows a clear political will to promote innovation, considered as the main driver to offset the loss of French competitiveness [2]; in 2016, €10 billion was devoted to innovation in France (national, regional and European funding), including €6.4 billion through the Research Tax Credit. In 2017, French R&D expenditure accounted for 2.19% of GDP[b]. By way of comparison, for the Republic of Korea and Israel, countries with the highest innovation expenditure, spending was 4.53% and 4.55% respectively. There is a global trend towards innovation promotion, with the average expenditure-to-GDP ratio rising from 1.95% in 1995 to 2.37% in 2017.

Innovation is therefore an unavoidable and promising, yet risky, process, so it must be initiated with a full awareness of the risk involved and with a keen knowledge of the methodological and practical tools to deploy in order to minimize it. This risk is all the more important because it affects everyone. Indeed, contrary to what one might think, failures in innovation are not the unfortunate prerogative of start-ups but a risk for any type of company; there are many examples of failures of companies known or recognized worldwide (New Coke by Coca-Cola, Google Health, Newton by Apple, etc.). A study [3] carried out on 215 new products launched in the Netherlands showed that the size of a company and its age do not in any way influence the probability of success or failure of a product.

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b OECD Statistics: https://data.oecd.org/fr/rd/depenses-interieures-brutes-de-r-d.htm

New Coca-Cola Coke

The failure of Coca-Cola's New Coke is nowadays considered as a textbook case of innovation failure. In the mid-1970s, a blind test conducted by Pepsi revealed a consumer preference for its own soda over that of its competitor. In 1984, Coca-Cola proposed a new recipe and obtained better blind test results than Pepsi. This recipe was marketed in April 1985, but only three months later, consumer dissatisfaction was so high that Coca-Cola was forced to do a U-turn and offer the original recipe again. Thus, by underestimating the importance of its consumers' brand loyalty, Coca-Cola created its most memorable failure.

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Google Health

In 2008, Google set up a medical records archiving service for American Internet users, which, according to the company, made it possible to improve the medical follow-up of certain patients. In 2011, the service was shelved. Many reasons have been put forward for its failure[c]. These are linked in particular to a poor understanding of users and a non-existent competitive advantage:

- Google only offered a data storage service, nothing more; the company did not give answers to the questions users had: "Will this allow me to better manage my health or that of my loved ones? Will this help me make appointments? Will it save me money on my health insurance or my next visit to the doctor? Does this allow me to automatically renew a prescription?"
- Google did not investigate enough what consumers/users really wanted, namely a fun, social and stimulating service through the interactions it would have allowed with other people.
- Users did not trust Google to store their medical data online.
- Google proposed a service that was too cumbersome, time-consuming, complex and unintuitive.

c www.mobihealthnews.com/11480/10-reasons-why-google-health-failed

In summary

Innovation can take very different forms and take place in all areas of society. It is a complex, inevitable and high-stakes process. However, it involves significant risks that spare no organization.

CHAPTER TWO

INNOVATION FAILURES: EXTENT AND FREQUENT CAUSES

The extent of failures in innovation

The failure rate in innovation projects increased significantly between the 1990s and 2000s, rising from 40% to 95% in the US and to 90% in Europe in 2004 [4].

Today, it is estimated that [5], in the development phase, as shown in GRAPH 1:

- 81% of products do not get past this phase

After marketing:

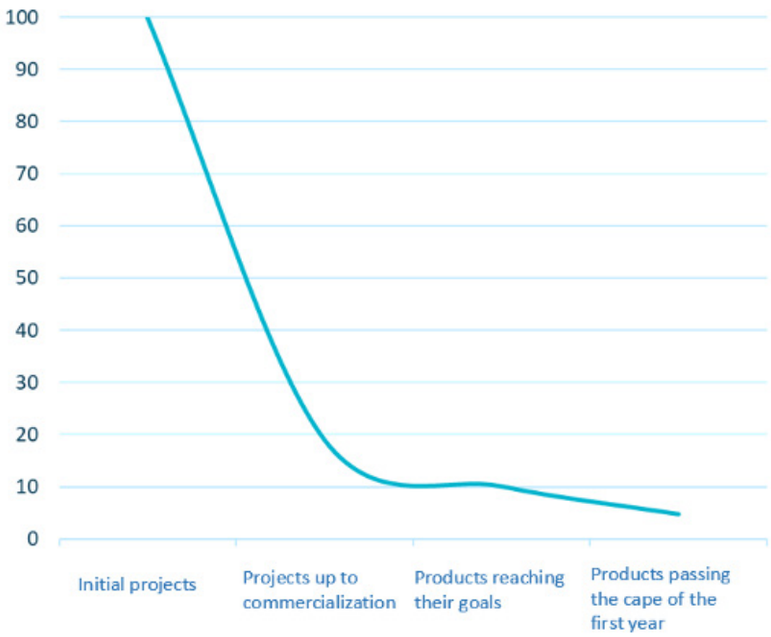
- 45 to 48% of new products do not meet their sales targets
- 44% are below their profitability targets
- 75% do not get past the milestone of the first-year mark

Of course, the later the failure occurs in the process, the greater the financial losses [6].

It should also be noted that the failure rate for new products varies across sectors [5]:

- 20 to 25% in the industrial sector
- 30% in services
- 70% to 90% in new technologies

For mass consumption, this figure is difficult to estimate (it varies between 35% and 95% depending on the study)



GRAPH 1 : Projects abandoned or not achieving their objectives according to the different development and marketing phases

Frequent causes of failure

The causes of these failures vary according to the phase reached by the innovation[d].

The causes of failures occurring during the development phase

During the development phase, the causes of failure are often the following:

* Poor product definition : too vague a definition, incomplete feasibility or market analyses, poor concept definition or evaluation and lack of consideration of the regulations and standards pertaining to the product. This poor definition may, among other things, be caused by a lack of consumer inclusion in the process, which leads to less clear objectives and a limited number of ideas.
* Lack of innovation culture, expertise, strategy or organization within the company (poor grasp of priorities, poor management and lack of internal collaboration).

Causes of failure of innovative products brought to market

Products that have passed the development phase and been brought to market succumb to failures mainly due to the following causes:

3 4 6
* Insufficient knowledge of users and uses: design of a product that is completely out of step with actual uses and poor estimation of the cost/benefit ratio for the user.

2 3 6
* Insufficient knowledge of the market: poor understanding of users' needs, overestimation of the market (e.g. not taking into account that markets are increasingly fragmented and that products are aimed at ever-smaller segments), poor understanding of the strengths of the competition and lack of any real competitive advantage.
* Bad timing: "Being right too soon is being wrong" [9] - for example, the electric car has existed since 1920, Apple's Newton failed in the 1990s before reappearing in 2007 under the name of Iphone, etc.

3 4
* Miscalculation of market value: overestimating profitability or "minivation", i.e. underestimating the value of a product resulting in prices being set too low or insufficient production for high demand[e].

3 5
* Failure to consider environmental factors: poor understanding of the legislative and economic environment, trends, or forgetting to take into account certain actors involved in product use (Who will sell it? Repair it? Etc.).

d The common causes of failure presented in this section were taken and compiled from several publications dealing with this subject, in particular: [4], [5], [7], [8], [9] and [10].

e See in particular: http://www.marketingjournal.org/monetizinginnovation/

- Paucity of methodologies and skills: misinterpreting or disregarding the results of market research, excessive haste to get to development, lack of collaboration (internal or external) or betting on individual genius rather than collective genius, all generally lead to failure; "Steve Jobs cases" are exceptions and not the norm [9].

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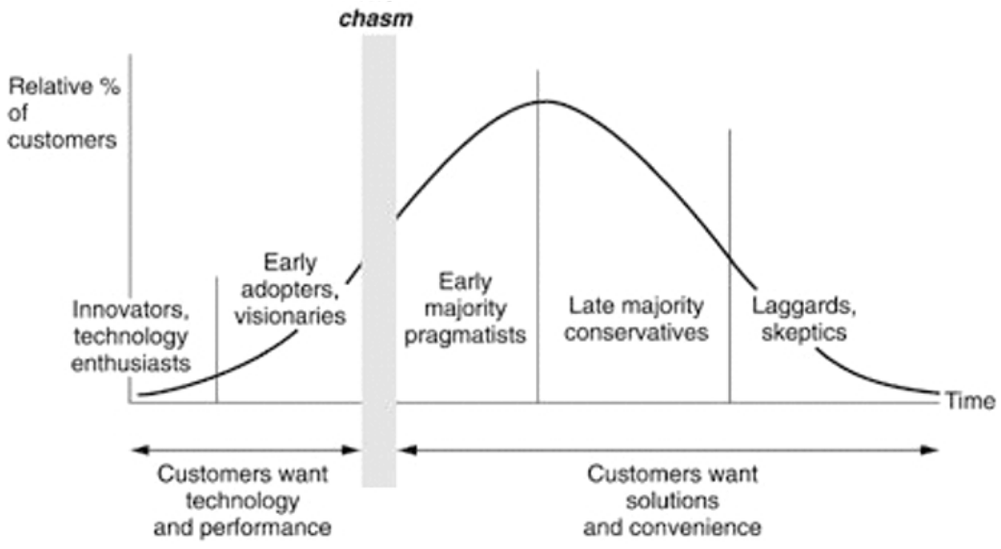
- Psychological biases and preconceptions, in particular the "pro-innovation bias": misleading certainty that a technological product is inevitably destined to impose itself upon society. This trend tends to generate products that are forever in a state of emergence and which are perceived as to be successful even if there is proof of commercial failure.
- Product targeting error in product development, resulting in failure to cross "Moore's Chasm"[f]: consumers who may or may not adopt innovations can be divided into five different categories (GRAPH 2). Consumers in the first two categories are highly receptive to innovation and easy to convince, but they are few in number. However, it is much more difficult to get the majority of consumers to adopt an innovation. There is a difficult "chasm" to cross between the receptive minority (which will create a misleading impression of success at launch) and the majority of consumers (who will contribute to commercial success).



GRAPH 2 : *Innovation diffusion curve with representation of Moore's chasm*

f Concept theorized by Goeffrey Moore (based on the work of Everett Roger), see in particular : [14]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The Segway

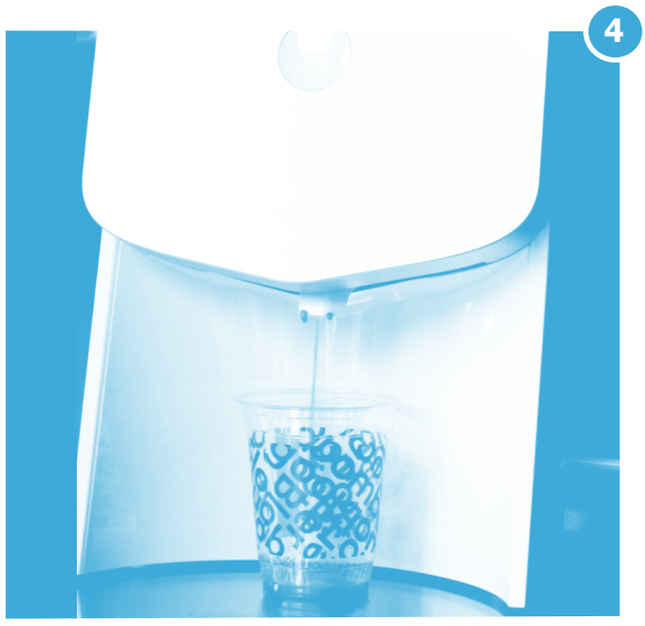
The Segway was launched in 2002. Its creators estimated that 10,000 would be sold per week, making it the fastest company in history to reach 1 billion in revenue; $100 million was invested with confidence in product development. However, the company failed to meet these expectations, selling only 24,000 after five years on the market. Several reasons are given to explain this failure:[g]

- First, the price; the Segway sold for $5,000, an amount that was incompatible with the ambition to reach a wide market.
- The market was not targeted; the product's creators did not seek to target a specific market for whom the Segway would meet a need.
- Users were not taken into account in the innovation process.
- City infrastructure was not suited to this type of vehicle (Where to park it? Should it be used on sidewalks or on the road? Etc.).

The Juicero

In January 2017, the start-up Juicero launched the Juicero Press, a smart juicer using individual fruit and vegetable bags sold exclusively by the company to subscribers. After a few months on the market, Juicero suspended its activities and became "the laughingstock of Silicon Valley"[h]. The main reasons for this failure were threefold:

- The price of the machine, valued at $400: This amount was high enough, in the very first months, to prevent the company from succeeding in its goal to reach a large target.
- A viral video showing the uselessness of the machine: journalists broadcasted images showing that they obtained the same result as Juicero by pressing the fruit and vegetable bags by hand.
- Users were not taken into account in the innovation process, and the start-up was therefore based on the idea of solving a problem that was actually not a problem.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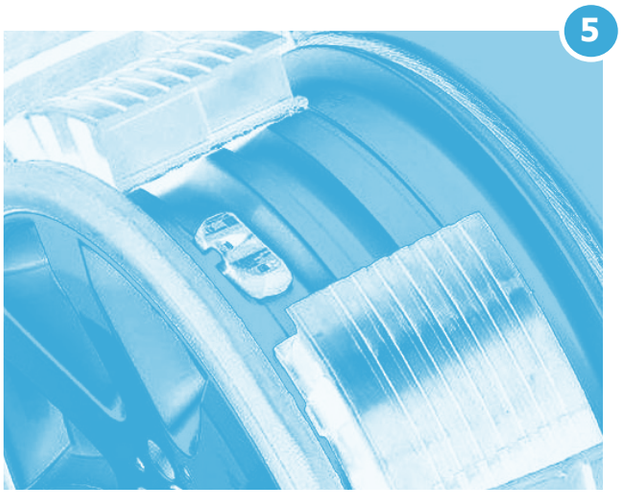
g www.content.time.com/time/specials/packages/article/0,28804,1898610_1898625_1898641,00.html,
www.hbrfrance.fr/magazine/2015/09/8219-les-pieges-de-locean-rouge/
www.destination-innovation.com/why-did-the-segway-fail-some-innovation-lessons/

h www.siliconvalley.blog.lemonde.fr/2017/09/01/juicero-la-start-up-devenue-la-risee-de-la-silicon-valley-ferme-ses-portes/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Michelin's PAX System

In the 1990s, Michelin introduced a tire equipped with sensors and a special rim that allowed drivers to be informed of a flat tire by a warning light on the dashboard and to drive 200 km before being forced to replace it. This innovation was both practical and beneficial in terms of safety.

Despite this, and despite an alliance with Goodyear and commercial release of the tires on new Mercedes, Audi and Honda vehicles, the product was such a failure that it was withdrawn from sale in 2007 [10, 11]. Why? Because of the failure to take into account a central player in the tire ecosystem, namely garages. Indeed, the machinery required to repair these equipped tires was very expensive and bulky. Garage owners did not see the point of buying it, which does not seem to have been anticipated by Michelin.

The Smart Refrigerator

Merging of the refrigerator and new technologies has been a recurrent approach for the past twenty years. Such merging would, for example, eliminate the need to worry about restocking common products since the refrigerator could automatically order a product that would run out.

However, these marketing attempts almost systematically fail [8, 12] with the exception of some countries such as Korea or Japan. This failure has been analyzed several times, in particular by Nova [8][i] who invokes multiple reasons:

- First, it seems that the interest in combining the functionalities of two existing objects does not seem to make sense to users (they do not see how this merger would provide any new functionalities other than those already existing separately). Moreover, since the price of these appliances is generally high, the result is that the acquisition of an appliance "that costs more than the sum of a fridge and a computer has proven to be absurd for users" (p. 34).
- The product life chain seems to be omitted; refrigerator is rarely changed while a computer replaced much more frequently. It therefore appears that users tend to think that a smart fridge would quickly become obsolete.
- There is a disparity between the proposed uses of such appliances and their actual uses in the kitchen; the features they offer are inconsistent with habits, or with what other items already offer them (for example, you can already follow a recipe on a tablet or use post-it® notes).
- It appears that the functionalities of automatic ordering of missing products are not adapted to the habits of users because they imply an eating routine that is not necessarily appreciated nor spontaneously followed.
- It is interesting to note that, paradoxically, when such products fail, the various players in the household appliances sector seem to persevere in proposing new models.


6

i Himself referring to [12] and [13]

In summary

Many failure factors constitute traps for the innovating company throughout the emergence process for the new product/service. Some of these cause the project to be abandoned during the development phase, while others cause the product to fail after its market release. This second scenario has far more serious negative consequences.

Whether during the development stage or after market release, the 10 most common causes of failure are:

- **Poor product definition;**
- **Lack of innovation culture, expertise, strategy or organization within the company;**
- **Insufficient knowledge of users and uses;**
- **Insufficient knowledge of the market;**
- **Bad timing;**
- **Miscalculation of market value;**
- **Failure to consider environmental factors;**
- **Paucity of methodology and skills;**
- **Psychological biases and preconceptions;**
- **Product targeting error resulting in failure to cross "Moore's chasm".**

CHAPTER THREE

POSSIBLE SOLUTIONS TO REDUCE THE RISK OF FAILURE

Logics and solutions to be implemented

As the most common causes of failure have been identified, the next step is to determine the logics and solutions to implement in order to avoid these.

First, it is better to incorporate user knowledge as early as possible in the innovation process (from the concept stage), and it should be as detailed as possible. The innovation must meet the needs and problems of users. It must also make it possible to strike a balance between their existing uses and the new uses it proposes.

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Of course, knowledge of the competition must be as extensive as possible so as to offer a better product and develop a more effective marketing strategy, and all environmental and practical parameters must be enumerated and analyzed for the new product (usage contexts, regulations promoting or restricting use, persons indirectly affected its use, etc.).

Additionally, the methods used in market research and co-creation processes must be adequate and tested. Also, primary importance must be given to the results obtained from studies rather than to preconceptions, hopes and other assumptions. Adopting a collaborative mind-set and methods is also highly recommended. In this regard, it is better to seek maximum interdisciplinarity and an optimal balance between technological and marketing prowess.

Finally, market analysis must be detailed and relevant and consider highly-fragmented market segments. It is recommended to target the most relevant segment, i.e. the one for which the innovation will have the greatest possible added value, and not to widen the scope too quickly to other targets before the first has been fully exploited. This will improve the chances of crossing "Moore's chasm".

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EXAMPLE 7: *Haier's laundry and potatoes washing machine*

Haier's laundry and potatoes washing machine

In the early 2000s, a technician employed by Chinese household appliance manufacturer Haier visited a farmer who complained that his washing machine was not working properly. When he arrived on site, he realized that the farmer used it not only to wash laundry but also the potatoes he grew. The company then realized that this was common practice in rural areas and decided to develop a new washing machine, the XPB40-DS, designed for both uses (laundry and potatoes). The first 10,000 models were sold immediately, and the product was a great success in China. The improved version of this model enabled Haier to become the world's leading supplier of household appliances in 2009 [15, 16].

Factors to consider

As a theoretical discipline, innovation encompasses and is based on a number of factors that each project must consider. They offer guidelines to increase the chance of success of the process. Here, we look at five of these: ergonomics, usability, acceptability, the notion of uses and the different types of designs that involve users.

Ergonomics

Ergonomics is the "scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance"[j]. Two types of ergonomics can be distinguished from each other: the first, cognitive ergonomics aims to "make the functioning of technical systems compatible with the mental functioning of man" [18, p.40], the second, physical/physiological ergonomics, focuses on the study of physical constraints.

Usability

Usability can be defined as "the impact of the combination of human characteristics and mental models on product performance".[k] This is a concept that is very similar to that of ergonomics, but it comes from a different scientific tradition and does not consider health and safety aspects[l].

More specifically, usability is defined by ISO 9241-11 (1998) as the "extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use"[m]. Effectiveness refers to the ability to achieve a given objective (task success and quality of performance). Efficiency, on the other hand, refers to the ability to perform a task with a low effort (rate and nature of errors, execution time, number of operations required and workload). Finally, satisfaction corresponds to the positive emotional reaction produced in the user by using the product.

j Definition of the IEA (https://iea.cc/what-is-ergonomics/), quoted in [17]

k William S. Green, quoted by [18]

l www.fr.wikipedia.org/wiki/Utilisabilit%C3%A9

m Quoted and explained by [18]

Acceptability

Acceptability is considered a key factor in consumers' decisions to adopt or not adopt an innovative product or service. Many theoretical models exist to describe and explain it.

The best known and first to be used as a reference is the Technology Acceptance Model (TAM) [19, 20]. This model asserts that the two main acceptability factors are perceived usability and utility. It has been criticized, mainly because it fails to consider social influences and emotions [21]. Other models have therefore emerged, including the Unified Theory of Acceptance and Use of Technology (UTAUT) – which explains the intention to use an information system by expected performance, expected effort and social influence – and the Consumer Acceptance of Technology (CAT), illustrated in FIGURE 1, which considers that the intention to adopt a product is determined by cognitive factors (relative benefits, perceived utility and usability) and also emotional factors (pleasure, activation and dominance/feeling of control).

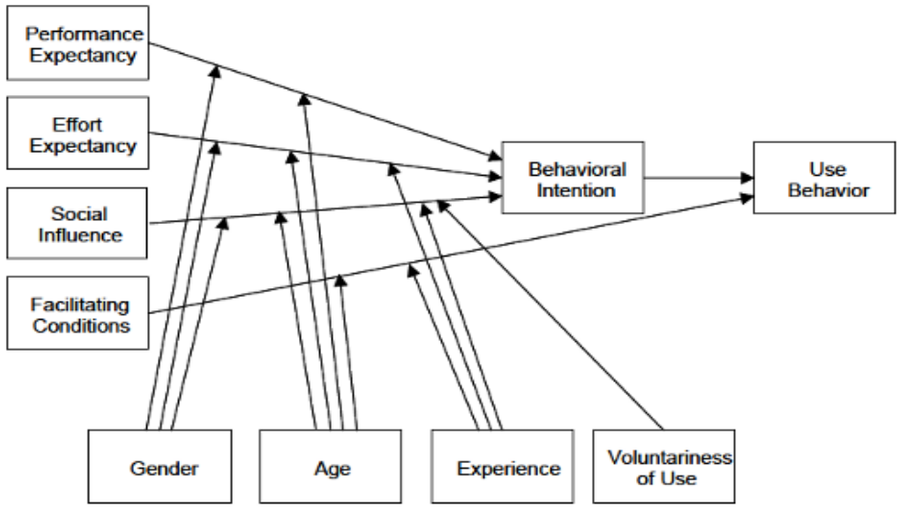

FIGURE 1 : *Customer Acceptance of Technology (CAT)*[o]

n [23] referring to [24]

o Image source : www.elefelious.files.wordpress.com/2013/03/utaut.png

The notion of use

Use can be defined in several ways – "Use of a material or symbolic object for a particular purpose", "social practice that seniority or frequency makes normal in a given culture. " – and it is an "element of the value of the product for the user"[n]. Many disciplines rely on a certain expertise in uses for the design of innovations (ergonomics, sociology, anthropology, semiology, physiology, linguistics, marketing, sensory marketing, micro-psychology) [25, 23] and, the more areas of expertise involved in the design, the better the understanding of uses in all their complexity.

From the standpoint of use analysis, the sources of uncertainty in innovation projects are mainly related to three phenomena [23]:

- The multiplicity of innovation "drivers": technology-push/market-pull contrast
- The complexity of diffusion: Rogers' curve and Moore's chasm
- The difference between incremental and disruptive innovation

The first major approach to use analysis is User-Centered Design (UCD)[p]. Based on the idea that design should be guided by scientific knowledge about humans, it focuses on user-centered design processes and associated general principles and concepts (user participation in the design process, division of tasks between users and system, iterative design – FIGURE 2 – and multidisciplinary design).

The second major approach to use analysis is the User Experience Design (UXD) – illustrated in FIGURE 3 – which extends the notion of use quality beyond its pragmatic dimensions by integrating the dimensions of fun, pleasure, hedonism and by allowing the control of the engagement dimension in the product/user interaction. In this approach, a positive user experience is likely to generate use value.

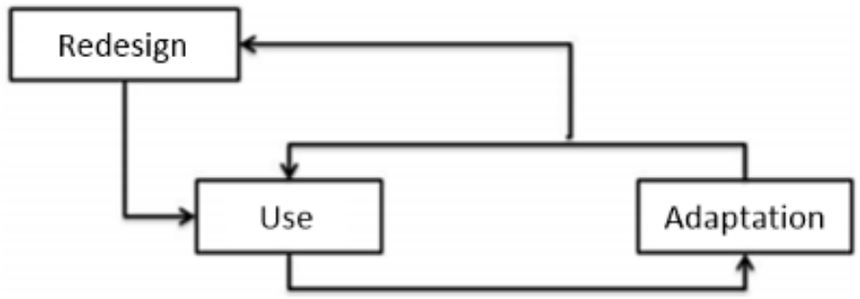

FIGURE 2: "User-adaptation-reconception loop" (Diagram of [26] retrieved from [23])

p Theorized mainly by Norman in 1988 in The psychology of everyday things and developed in the 90s.

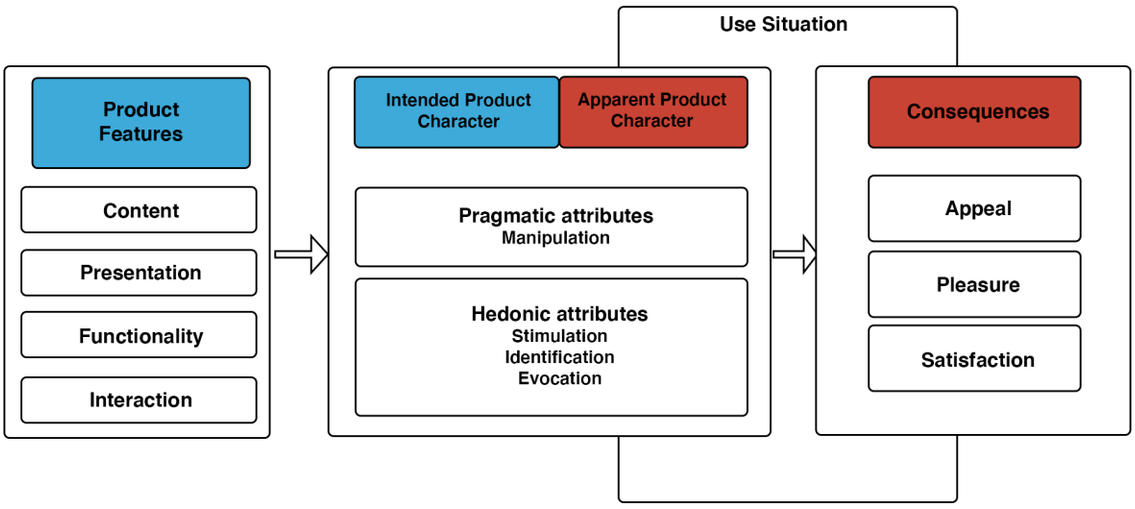

FIGURE 3 : "Model of user experience, from the perspective of the designer (in blue) and the user (in red). " (Figure by [27] taken from [23])

Different types of designs that include users

There are several types of designs that include users [18]. The first is the user-centered design in which the user is present at all stages of development. We therefore consider, from the design stage, their needs and differential characteristics (cognitive, physical and experience capacities, etc.). Several modalities of user integration are possible depending on the method chosen (in interaction with a context, evolving in a specific social environment, having a certain level of expertise, etc.).

In the universal/inclusive design model, the applied approach is to try to consider as many users and contexts of use as possible, in order to reconcile the needs of the average individual and particular individuals (e.g. persons with disabilities). Finally, holistic inclusive design is a similar approach to the previous one, but personality and cultural aspects are taken into account.

Methodologies and tools to be adopted

Many methodologies and tools exist to support user-centered innovation approaches. Several (but not all) of these are presented here along a four-phase iterative timeline of project maturation: Explore, Imagine, Experiment and Develop. TABLE 1 seeks to locate each method presented along this timeline and compare it with the causes of failure that it predicts.

<table>
<tr><th></th><th>Explore</th><th>Imagine</th><th>Experiment</th><th>Develop</th></tr>
<tr><td>Poor product of service definition</td><td>Strategic diagnosis of the positioning</td><td>TRIZ, CPS, C-K Theory, Use scenarios</td><td rowspan="2">CAUTIC®, KANO, EMINOSA®</td><td rowspan="2">Joint analysis (trade--off), Ergonomics tests, Usability tests</td></tr>
<tr><td>Insufficient knowledge of Users and uses</td><td>Ethnographic exploration, Prospective analysis, U&A studies</td><td>Definition of personae, Use scenarios</td></tr>
<tr><td>Insufficient knowledge of the market</td><td colspan="4">PESTEL Analysis, Prospective analysis, Positioning studies, U&A studies</td></tr>
<tr><td>Bad timing</td><td>Prospective analysis</td><td></td><td>CAUTIC®</td><td></td></tr>
<tr><td>Miscalculation of market value</td><td></td><td>Development of the business model</td><td>Estimation of willingness to pay: EcoXP method</td><td>Joint analysis (trade-off)</td></tr>
<tr><td>Failure to consider environmental factors</td><td>PESTEL Analysis, Prospective analysis</td><td>Development of the business model</td><td>Simulation and testing of the business model</td><td></td></tr>
<tr><td>Targeting error</td><td colspan="2">"Blue Ocean" type positioning studies</td><td>CAUTIC®</td><td></td></tr>
<tr><td>Lack of a culture of innovation in the company</td><td colspan="4" rowspan="2">To be informed, to be trained, to be accompanied by professionals</td></tr>
<tr><td>Paucity of methodology and skills</td></tr>
<tr><td>Psychological biases and preconceptions</td><td colspan="4">To use appropriate methods and rely on results to challenge assumptions</td></tr>
</table>

TABLE 1 : *Methods and tools to support user-centered innovation approaches*

The different methods by phase

Methods of the "Explore" phase

Prospective analysis

The term *prospective* comes from *prospecting* (exploration of new fields) and *perspective* (notion of point of view and outlook)[q] and this type of analysis uses the simulation of possible future scenarios [23]. Two of the tools of prospective analysis are therefore the use of use scenarios and personas. Generally, it is possible to integrate users into these scenarios in three ways [28]:

- They are not physically present but simulated by a dummy/digital character/software program
- They physically participate in a controlled experiment
- They are present and participate in a simulation in a participatory design process

Ethnographic exploration

"Ethnography, through the investigator's immersion in the environment under investigation, restores perspectives from below that are more varied than one might think; it allows the meeting of various points of view on an object, sheds light on the complexity of practices, reveals their degree of entrenchment." [29, p.11][r]. It consists in exploring real behaviors in natural or laboratory situations. It then makes it possible to rely on the user's concrete actions to ask him to explain his intentions and objectives. This interview-phase in the ethnography process allows hypotheses to be tested. It is also possible to use the shadowing technique, in which the user is constantly asked to express aloud what he or she feels, thinks or wishes to do. Ethnography is a powerful means of getting away from statements (attitudes) in favor of an understanding of actions (behaviors). It therefore makes it possible to reveal difficulties (pain points) or ways of doing things that are sometimes unconscious (routines).

The PESTEL analysis

The PESTEL model consists of identifying and categorizing negative and positive environmental influences that revolve around the innovative product. These influences are classified into 6 interrelated categories[s]: political, economic, sociological, technological, ecological and legal. From the study of these influences, a PESTEL analysis leads to the identification of pivot variables (most relevant information).

q https://fr.wikipedia.org/wiki/Prospective

r Our translation

s www.fr.wikipedia.org/wiki/Analyse_PESTEL#targetText=En%20strat%C3%A9gie%20d'Company%2C%20l,%2C%20the%20factor%20macro%2Environmental.

Usage and Attitude Studies (U&A)

"A usage and attitude (U&A) study involves research which aims to 'understand a market' and identify growth opportunities by answering questions on whom to target, with what and how"[t]. Useful for identifying links between usage behaviors and opinions, this type of study can be conducted in several ways, but generally includes:

- Some market sizing
- Some understanding of categories (who is the user, what/when/where/where/how, etc.)
- Some understanding of brands (penetration, perception, choice factors, etc.)
- Some information for targeting (attitudinal or behavioral segmentation)

Strategic Diagnosis of Positioning

The strategic diagnosis of positioning can be carried out using several methods and tools, including the well-known Business Model Canevas[u]. This tool – illustrated in FIGURE 4 – allows to build value proposition in such a way that it proposes relievers and gain creators that meet the lived pain points and expected gains of the target clientele.

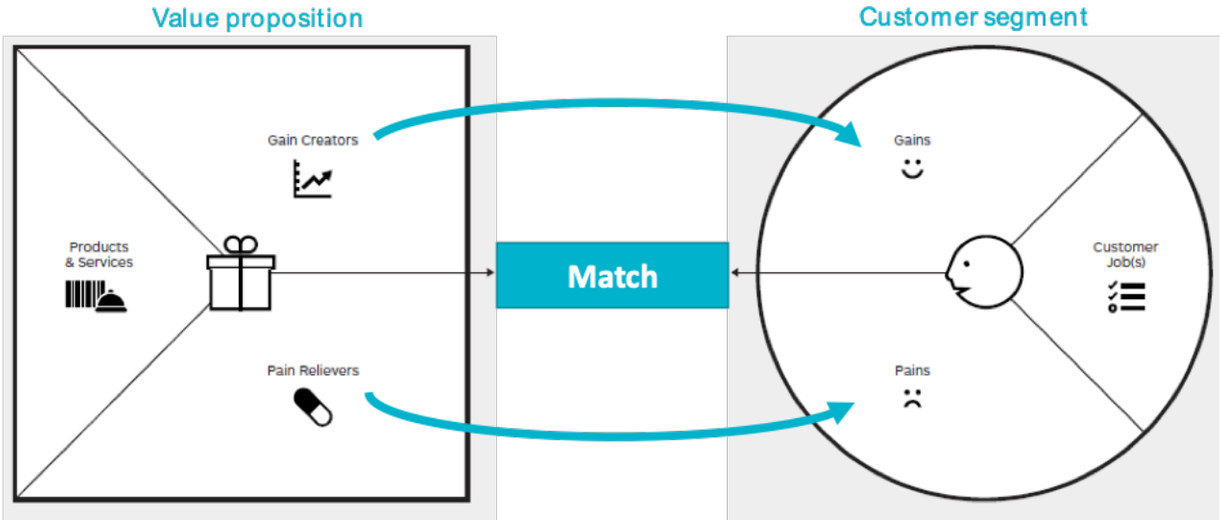

FIGURE 4 : *Value Proposition Canvas*

t www.ipsos.com/en/ipsos-encyclopedia-usage-attitude-surveys-ua

u www.strategyzer.com/

Positioning Studies such as Blue Ocean

Blue Ocean [30] type positioning studies consist in analyzing the market in order to create a blue ocean space, new and therefore very uncompetitive, as opposed to the red ocean, well known and completely saturated. Based on a detailed understanding of the values of the various players in the market in question, it is necessary to identify new values from which it would be possible to create a highly and lastingly differentiating offer in relation to all forms of competition. To successfully carry out a Blue Ocean approach, a good knowledge of the players is therefore necessary and can justify the implementation of qualitative and quantitative methods to obtain a good market representation. From this, a creative approach is often necessary to identify sources of value creation.

Methods of the "Imagine" phase

The TRIZ method

The TRIZ method (FIGURE 5) was developed by Genrich Altshuller from studies of many patents in which he noted that design problems encountered were often identical from one product to another and that similar solutions can therefore be considered. The aim of this method is to stimulate creativity by proposing tools to unblock mental inertia (i.e. confinement in a vocabulary and a system of thought related to a technical field). It consists in not directly solving the problem addressed, but in going through an abstraction stage that makes it possible to construct a generic problem based on contradictions. The process is divided into three phases:

- abstraction of the problem expressed as contradictions
- generic problem resolution
- practical application of the solution (return to the initial problem).

The goal is to achieve an Ideal Final Result (IFR), i.e. the description of an ideal object that maximizes useful functions and minimizes harmful functions and costs.

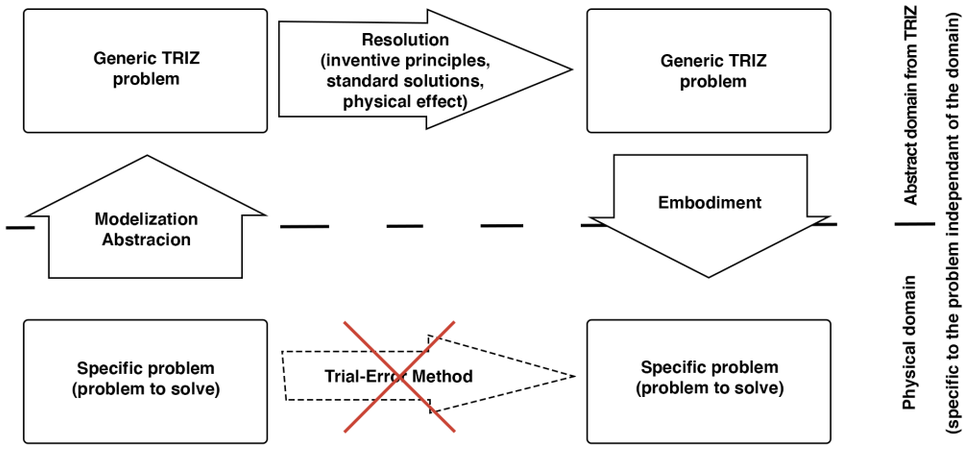

FIGURE 5 : *TRIZ Method*[v]

v https://fr.wikipedia.org/wiki/TRIZ

The CPS method

CPS is a creative problem-solving method developed by Alex Osborn and Sidney Parnes. Several variants of this method exist but, generally, the process is divided into 8 main steps:

- Characterization of needs
- Data search
- Definition of objectives in the form of a vision and associated challenges
- Search for ideas
- Definition of selection criteria
- Search for solutions
- Checking of adherence to the solution
- Definition of a "large mesh" action plan.

The general principle of CPS is to divide the work into phases of divergence (producing many new ideas) and convergence (returning to the original problem with the ideas created) to find and formalize responses to creative challenges.

The C-K theory

The C-K theory was created in 1995 at the Ecole des Mines de Paris and aims to provide modern methods useful in innovation projects and in leading research or engineering teams [31]. It originates from the observed paucity of approaches that integrate design, research and creativity methods.

The theory is based on interaction between spaces: that of concept (C) in which everything is possible and knowledge (K), which then expand upon and inform one another in the innovation process. New knowledge thus gives rise to new concepts, and new concepts make it possible to target new knowledge to be acquired[w].

w www.ck-theory.org/la-theorie-ck/

Defining personas

A persona is a fictitious person whose characteristics will be defined to allow them to embody a target group of users that they will then represent. They are usually given a first name, a job, a family status, a description of their personality and their needs/expectations, etc. This persona is generally integrated into a use scenario that can be tested with users to compare this projection (imagined target and scenario) with feedback from the field.

Use scenarios

Use scenarios detail the stepwise interaction of a potential user with the service or product, framing this interaction as a narrative. It not only clarifies the characteristics of the service or product but also allows the user's concrete and illustrated experience to be narrated. In particular, it serves as a test support for users.

Development of the business model

The business model - illustrated in FIGURE 6 - shows how a company or group of companies creates value with an activity and how this value will be shared between the actors who have contributed to it. Two key elements form the framework of the approach: value creation and value capture.

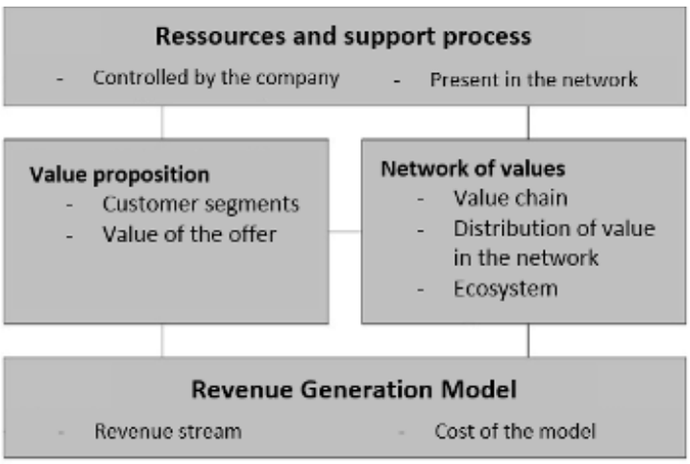

FIGURE 6 : Simplified model of the Business Model concept

Methods of the "Experiment" phase

The CAUTIC® method

The CAUTIC® method is a qualitative method that aims, by addressing two aspects relating to use (practices and representations), to assess the degree of acceptability of an innovation and to propose areas for improvement. It applies to a "use-oriented" concept clearly defined to be understandable by a person outside the project and uses a grid of 19 criteria making it possible to ascertain whether the innovation "makes sense" to the user (i.e., if it creates positive use meanings). These criteria are divided into four levels:

- Assimilation of the new technology into the user's usual technical know-how
- Association of innovation with current user practices
- Appropriation of the innovation to the user's private or professional identity
- Adaptation of innovation to the user's private or professional environment

The KANO method

The KANO method, developed by Noriaki Kano in 1984, aims to understand how consumers perceive and evaluate the quality of a product. It is based on the idea that the presence of a function is not symmetrical to its absence in terms of effect. It thus makes it possible to establish, for each function/attribute of a product, whether it is:

- Mandatory (must-be), i.e. that must be achieved and does not produce a high level of satisfaction, but its absence results in a high level of dissatisfaction (generally not expressed because its presence is considered obvious by the consumer – for example, rear window wipers on a car –)
- Proportional (one-dimensional), i.e. its presence proportionally increases satisfaction (for example, the distance travelled with a vehicle for the same amount of fuel)
- Attractive, i.e. that is not expected and causes strong satisfaction
- Reverse, i.e. which results in rejection when present
- Indifferent, i.e. does not provoke a reaction of satisfaction by its absence or presence

The EMINOSA® method

The EMINOSA® method [33] – illustrated in FIGURE 7 – is a method for predicting the acceptability of an innovation based on modelling of the relationships between emotion and cognition. Information is collected based on a set of predefined criteria, with the different targets addressed by the innovation concept. Based on a "supervised cumulative learning" algorithm, EMINOSA® can predict cognitive patterns and acceptability potential based on the emotions reported by users.

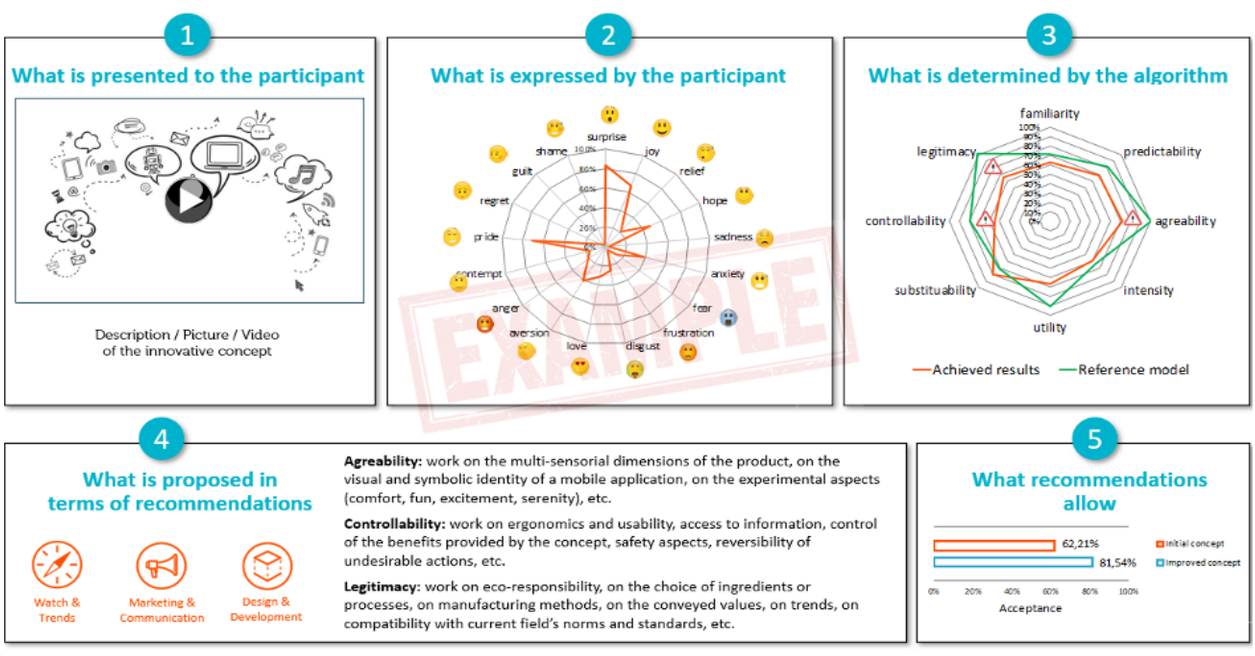

FIGURE 7 : *The EMINOSA® method*

Estimating willingness to pay: The EcoXP method

The purpose of estimating willingness to pay is to estimate the price that is most likely to be accepted, also known as the acceptability price. Overall, it consists of asking respondents how much they would be willing to pay for a product and calculating what the acceptability zone is, i.e. between what minimum and maximum amount the product can be sold (see FIGURE 8 for an example of results).

The combination of the two parameters (minimum and maximum price) makes it possible to determine the optimal acceptability price (i.e. the one that maximizes the number of prospects) or the optimal profitability price (i.e. the one that maximizes revenues).

We can zoom in on an interesting approach, the EcoXP[x] method, which brings together different tools from experimental economics applied to consumption behavior. It provides additional analytical elements to studies on the use of sociology or creativity, namely:

- The understanding of consumers' expectations and beliefs regarding the scope of the innovative solution: a "fair price" tool
- The characteristics/attributes that determine the value of innovation from the consumer's point of view: the "calibrated auction" tool
- The willingness to pay for the innovative solution, for the individual and in terms of ideas that consumers may have of it: a "psychological pricing" and "inferred pricing" tool.

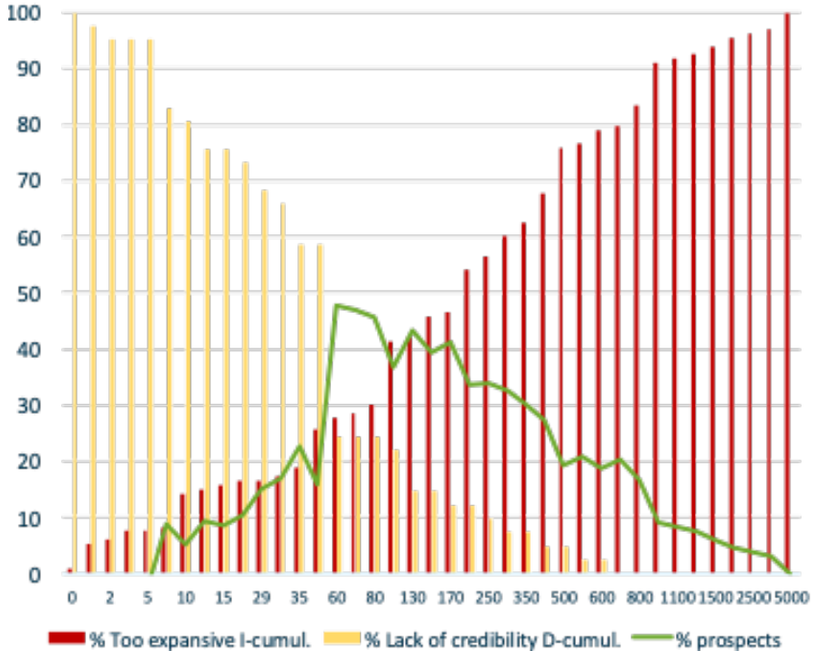

FIGURE 8 : *Estimating willingness to pay – example of results*

x Developed by the Laboratoire d'Economie Appliquée de Grenoble (University of Grenoble Alpes)

Simulation and testing of the business model

Based on a good knowledge of the willingness to pay and different business model assumptions, it is thus possible to develop scenarios. It is possible to test the differential acceptability of several scenarios, in particular by using the Cautic® method. By inputting the results obtained into a simulation model, we can compare each of the scenarios in terms of advantages and disadvantages, considering their respective income generation.

The methods of the "Develop" phase

Ergonomics tests

Testing product ergonomics from the design stage is a "proactive and preventive" approach [34] and the costs of design ergonomics are lower than those of corrective ergonomics. It is also a way of considering the human being from the design phase [17].

Usability tests

A widely-used way of testing usability is to use the usability criteria of Scapin and Bastien [35], which were initially developed to test the usability of web interfaces, but which are easily adaptable to other types of products. They are grouped into 8 types of criteria:

- Guidance: means available to guide use in its interaction with the system
- Workload
- Explicit check: fact that each action in the system is a response to a user request
- Adaptability: the system's ability to adapt to the context and the user's needs and preferences
- Error management: means available to prevent, reduce and correct errors
- Homogeneity/coherence
- Meaning of codes and names: clarity of the messages transmitted by the system to the user
- Accounting: the extent to which user/system interactions adapt to user characteristics and the extent to which the system adapts to a wide variety of environments

Joint analysis (trade-off)

Joint analysis (or trade-off) is useful during the design phase. It allows one to determine the importance of each attribute of an offer and to analyze the preferences of targeted customers. Based on the assumption that a customer follows a compensatory logic when purchasing a product/service, the respondent ranks several bid proposals with different attributes. Thus, he makes compromises between the different attributes, which allows, in the analysis phase, to see his expectations emerge in terms of the characteristics of each attribute and its importance in choosing to purchase the offer. The resulting trade-off model allows you to simulate potential or competing offers, determine the importance of each attribute of the offer and analyze the preferences of targeted customers.

The Main Tools for Applying Methods

The methods we have just presented require the right tools in order to be used. TABLE 2 compares these methods with the relevant tools. We then detail the means of collecting information from users (the methods to be deployed internally do not require explanation).

	Internally		Meeting Users				
	Desk Research	Workshops	Focus Groups	Interviews	In-Situ Observations	Online Surveys	DELPHI Method
Strategic diagnosis of the positioning	■						
Ethnographic exploration			■	■	■	■	■
Prospective analysis	■		■	■			■
U&A studies	■		■	■	■	■	
PESTEL analysis	■			■			■
Positioning study	■	■					
"Blue Ocean" type positioning studies	■	■					
TRIZ		■					
CPS		■					
C-K Theory		■					
Definition of personas*	■	■		■	■		
Development of the business model*		■					
Use Scenarios*		■					
CAUTIC®			■	■		■	
KANO			■	■		■	
EMINOSA®		■		■		■	
Estimation of willingness to pay: EcoXP method			■	■		■	
Simulation and testing of the business model			■	■		■	■
Joint analysis			■	■		■	
Ergonomics test			■	■	■	**	
Usability test			■	■	■	**	

TABLE 2 : *Tools adapted to the methods*

** We focus here on the generation means that will allow us to create the personas, business models and use scenarios, and not those that will allow us to test them*

*** For interfaces only*

Focus groups

The focus group is a qualitative information gathering technique, defined as a structured discussion with a small group of people. Led by a moderator, it aims to produce qualitative data from a set of open-ended questions [36]. It can have different purposes (concept tests, packaging tests, etc.) and is particularly useful for identifying degrees of consensus, targeting expectations and seeking solutions in a prospective way. It is one of the most widely used qualitative research techniques. Its advantages are not only to gather a wide variety of information and opinions in a short time and with a limited number of participants, but also to explore a subject in depth. It is, however, expensive (costs of premises, travel, recording equipment, translations, incentives, preparation, etc.).

Interviews

There are several types of interviews: structured, semi-structured and exploratory, face-to-face or remote (telephone, Internet). They use different techniques. For example, the comprehensive interview encourages flexibility and inventiveness during the process, particularly since the interview guide is more of a guideline than a list to follow to the letter [37]. This technique aims to break down the interviewer/respondent hierarchy and move closer to spontaneous conversation. Another example is the explicitation interview, created by Pierre Vermersch, which consists in looking at a previously carried out action in order to allow explanations to emerge that were not necessarily conscious during that action.

In Situ Observations

In situ observations consist in observing practices in real situations. They make it possible to go beyond statements and get as close as possible to the user's environment. Several methods exist to observe the user in a more or less invasive way and these can be complementary. Their main advantage is that they make it possible during an interview to identify, and even drill down into, the unconscious practices of the user.

Online Surveys

Online surveys are the most cost-effective process and yield a higher number of respondents than other information-gathering techniques. They are therefore most often used as a quantitative information-gathering tool.

The DELPHI Method

The DELPHI[x] method, developed by Norman Dalkey Olef Helmer[y], is used to structure expert consultation on a particular topic. In its initial form, it was used to identify areas of convergence, consensus and uncertainty. Variations exist and may have other objectives. For example, the DELPHI argumentation method is also used to develop relevant arguments. The principle of this method is the submission of a survey to experts taking an iterative approach; during each consultation round, latest findings are enriched by the results of previous surveys. The experts then have access to these results and must therefore answer a new version of the questionnaire enriched by the group's answers.

y According to www.fr.wikipedia.org/wiki/M%C3%A9thode_Delphi and [38]

z RAND Corporation, 1948

In summary

Fortunately, to minimize the risk of failure, it is possible to develop good habits and implement the best solution in relation to the nature of the innovation, the level of maturity of the project and the context in which it is carried out. Each solution is the result, at each stage of the project, of a key combination of the best methods and tools and the skills needed to implement them.

CHAPTER FOUR

CONCLUSION

CONCLUSION

Innovation is a challenging field. But its need is increasingly obvious in the face of today's and tomorrow's challenges for a wide range of actors and fields. While, as this necessity has become increasingly important, the number of unsuccessful companies has increased, and these failures have been instructive and have allowed us acquire such a complete range of preventive correctives available today that it would be a pity not to take advantage of these.

Innovation is by its very nature surprising. Being able to correctly gauge this surprise effect makes it possible to predict whether or not an innovation will be rejected. The aim of this brief study has been to show that there are solutions that can improve innovation outcomes from the early stages of design. Between an entrepreneur or engineer’s good idea and a successful new product there is a gulf that is dominated by the symbolic, cultural, social, environmental and ethical dimensions of our relationship to things. It is by taking all these dimensions into account, as early as possible in the design process, that we are able to increase the chances of success of an innovative product or service.

Perhaps the main difficulty lies in the fact that any innovation project requires multiple skills, particularly in the Humanities and Social Sciences, which are not always available to project leaders. Any person or organization wishing to innovate should not hesitate to pursue this rich and exciting approach, albeit with some caution. This caution takes the form of core reflexes: constantly questioning one's project, making the most of all the knowledge and tools available, not hesitating to draw on unknown fields, with support where necessary, and always keeping in mind that innovation is aimed at the complex and contradictory entity that is the Human Being.

CHAPTER FIVE

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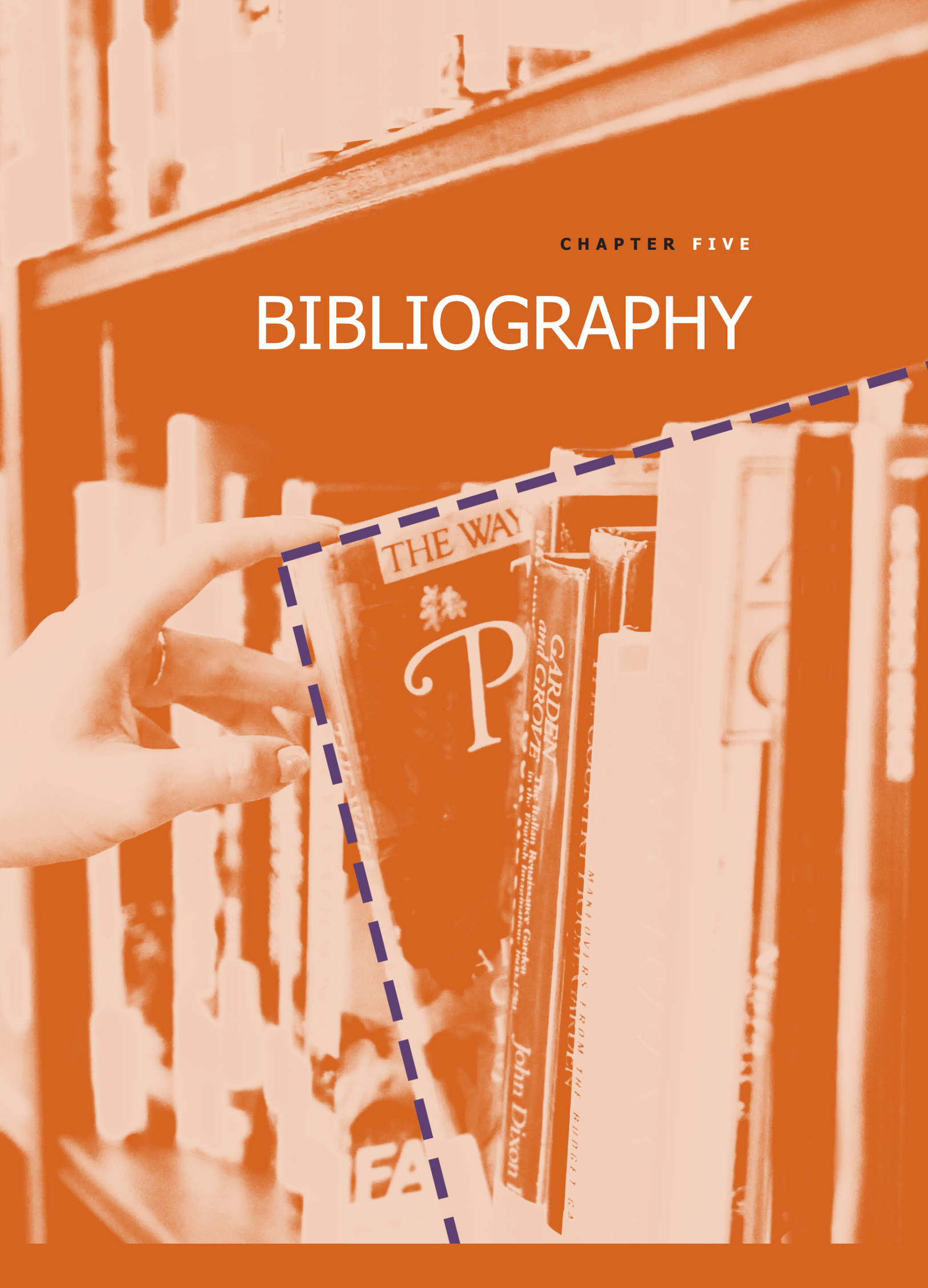

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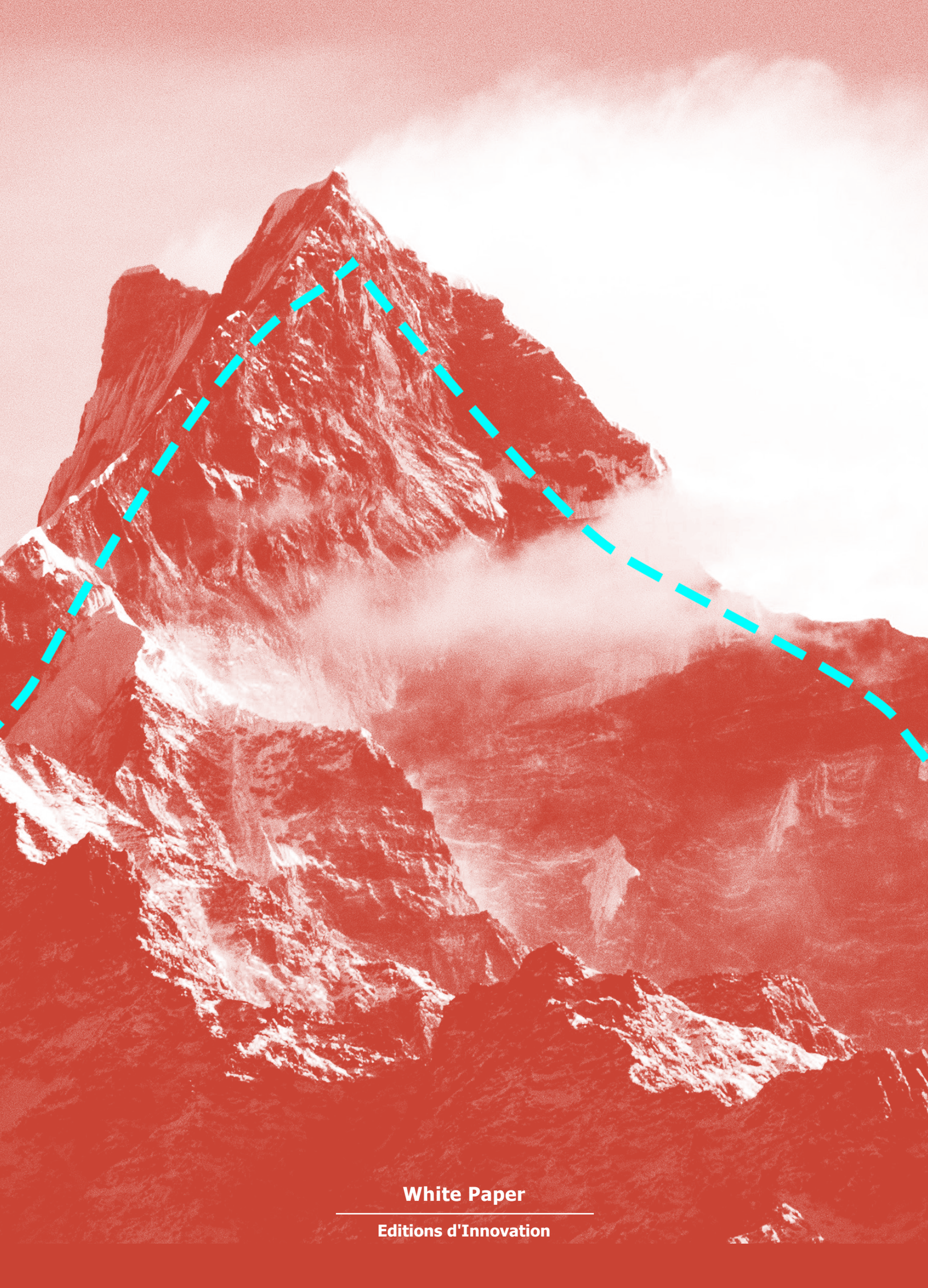
Acknowledgements

This white paper is the result of contributions from a multidisciplinary team passionate about innovation and committed to supporting innovation projects for 15 years within the Ixiade company. Thanks to the crossed views of psychologists, sociologists, marketers, engineers and designers, the main traps that need to be addressed in order to avoid the risks of failure in innovation have been identified and solutions have been proposed.
We would particularly like to acknowledge Doriane Simonnet (specialized in Natural Language Processing) who has carried this white paper project from its inception with great heart and tenacity and who has been able to mobilize the various expertise and contributions required to produce such content, as well as Niklas Henke (specialized in UI design) who has given this white paper its final form. We would also like to highlight the contributions of Charlotte Decorps (specialized in marketing), Emmanuelle Kelodjoue (specialized in Natural Language Processing), Florian Loeser (specialized in behavior and emotions), Zoé Masson (specialized in innovation communities) and Julien Soler (specialized in sociology of uses) for their experience sharing, contributions and re-readings, as well as Jean Caelen, scientific advisor of Ixiade and the University of Grenoble Alpes. Pascal Pizelle and Isabelle Fournié, respectively founder and human resources director of Ixiade, convinced that in the field of innovation, reducing the risk of failure linked to the human factor is a huge and permanent challenge, have initiated and supported all efforts to achieve the publication of this white paper.



White Paper

Editions d'Innovation