

Research Article

10 Laws of Technological Innovation Marketing: Technological Marketing Theory Series # 01

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Abstract

Commercial risk is inherent and symbiotic to technological innovation, as a consequence of its naturally novel character, which entails a greater or lesser degree of market unfamiliarity. This article presents a conceptual framework composed of a group of first-ten laws or principles of Technological Innovation Marketing, derived from an inductive approach based on more than a decade of marketing analysis of technologies belonging to sectors such as biotechnology, agribusiness, mining, environmental technologies, software, health and energy, among many others. The laws articulate general principles related to functionality, performance, market objection, adoption costs, functional specialization, indirect competition and technological transversalities. The analysis is supported by interdisciplinary literature on technology, marketing, institutional economics and diffusion of innovations, and is complemented by multiple real cases that are empirically retro-validated against the patterns described, consolidating the underlying concepts. The results reveal that functionality constitutes the primary value of any technology; that market resistance is structural and proportional to the degree of disruption; that perceived value depends on the integral cost of adoption; that specialization of technology increases value but reduces market size; and that every innovation faces pre-existing competition. The proposed model not only provides a coherent explanation of commercial risk, but also offers a practical tool for the validation, communication and adoption of emerging technologies. The expository structure allows any reader, with greater or lesser degree of specialization, within the framework of any territorial or technological reality, to re-think their own technology or technological innovation from the principles developed (bottom up) and, on that basis, return to it with greater commercial understanding (top down). Finally, the evolutionary character of the framework is recognized, opening the possibility of additional laws derived from new research and future evidence.

Keywords

Marketing, Technology, Technological Innovation, Technology Marketing, Diffusion of Innovations, Technological Specialization, Commercial Technological Risk

1. Problem to Attempt to Solve

Technological innovation constitutes one of the central pillars of contemporary economic development. However, although the Oslo Manual defines innovation as the successful

introduction of a new or improved product, process or method in the market [11], the specialized literature continues to show a significant gap in the understanding of the commercial risk

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inherent to innovations in particular, and of their commercial management in general—an area in which the discipline of Marketing is called upon to provide solutions.

The available empirical evidence confirms that most technologies do not achieve mass adoption, and that even patented inventions face high rates of commercial failure. This phenomenon cannot be conceived as explainable solely in terms of technical variables, since the spectrum covered by technological development in terms of areas of human knowledge, areas of human activity, business sectors, lines of business and products in particular is enormous. Such a high level of failures in accessing markets across such a wide range of technologies can only be due to intermediate factors—more structural absences—such as the absence of conceptual frameworks that integrate marketing, technological adoption and market behavior into a coherent structure of analysis, beyond the specificity of any technology.

2. Goals to Achieve

In response to this gap, this article proposes a conceptual framework composed of a first package of ten laws of Technological Innovation Marketing, derived from more than a decade of work with emerging technologies, patented inventions, technology transfer processes and adoption strategies in multiple productive sectors. Its objective is to establish general principles that allow understanding the functional, commercial and psychological logic that governs technological adoption, from which a practical guide can be derived to reduce commercial risk and improve the probability of success in validation and technology transfer processes.

3. Theoretical Framework

The search for general patterns or principles from the examination of certain facts is one of the bases of the scientific process, to the point that Bunge (1995) [1] notes that science is legalistic and essentialist, seeking to reach the root of things wrapped in their own appearances, and ultimately stating that such construction is achieved through the understanding of the relevant variables and the (invariable, he emphasizes) relationships that link them.

From this exposition, we can anticipate that this document seeks to achieve that scientific nature that explains the bases of the Technological Innovation Marketing, with the search to establish universally applicable principles being the best proof.

On the other hand, the generation of human knowledge can take 02 major paths or approaches: top down (from theory to practice) and bottom up (from practice to theory), and it is a relevant question to ask: in the case of top-down approaches, how was that pre-existing theory from which one starts created?

A top-down approach, for example, can be found in Newton's Second Law of Motion (1687), which we quote verbatim

and see as applied knowledge, a formulation ready to be used: "The net force applied to an object is directly proportional to the acceleration it acquires and is inversely proportional to its mass" [16].

It is evident that the practical or factual validation of this law requires a series of measuring instruments within environments with controlled factors.

On the other hand, we have bottom-up type principles or laws, such as the principle of impenetrability of matter, which does not appear explicitly as another Newton's Law, but clearly is a foundation of physics:

"Two bodies cannot occupy the same space at the same time" (principle of impenetrability of matter) [16].

Which, unlike the previous one, is perfectly verifiable by itself, in any circumstance and place; simple observation by the spectator suffices—a scenario within which we have sought to frame the development of this document.

Literature on technology converges on a central idea: technology is, above all, know-how oriented to a practical end. Authors such as García Córdoba (2004) [3], Herrera (2002) [5] and González et al. (2004) [4] define technology as practical knowledge, derived from or supported by science, whose purpose is to order the world through functional solutions to concrete problems.

This line is reinforced by the definition of the Royal Academy Dictionary, which incorporates the component of "practical use of scientific knowledge," and which, when complemented with the authors cited above, allows abstracting four key ideas: know-how, practical end, practical knowledge and practical use.

From this synthesis, this article proposes to understand the essence of the concept of technology as "something that serves for something," that is, an artifact or system whose primary value is its functionality (fx).

This functionalist perspective aligns with Bunge's (1995) [1] epistemological tradition, from whom we already know he argues that scientific knowledge seeks laws and general patterns that explain the stable relationship between relevant variables, allowing effective intervention in reality.

Regarding innovation, the Oslo Manual (2018) [11] defines the business innovation process as a new or improved product or process that differs significantly from what previously existed in the firm, successfully introduced in the market [10]. Zelada (2025b) [32] emphasizes the paradox: innovation process requires marketing as a key driver concept, but its theoretical development is still a pendant issue.

From Kotler's classical formulation (1967) [6], marketing is understood as a social and administrative process by which individuals and groups obtain what they need and want through the creation and exchange of products with value.

This view places perceived value as the core of marketing. Zelada, taking up this tradition, has emphasized in dozens of articles that marketing is not reduced to communication or advertising [26], but rather "is born in the product" [25] and in its ability to generate effective value for the customer. [28].

Under this context, the literature on technology marketing should be governed by the concept: set of activities of conceptualization, pricing, distribution and promotion of technologies, with the objective of transforming technological knowledge into marketable products and accompanying entry into early high-risk markets [29].

In practice, however, most of these contributions focus on specific sectors (ICT, electronics, smart textiles, etc.) and lack a body of general principles applicable transversally to biotechnology, mining, agribusiness or environmental technologies.

Zelada (2025c) [34], evidences an even more marked gap: marketing is rarely integrated as a structural function of technological innovation processes, despite demonstrating significant increases in the use of technological services when applied systematically.

The literature collects models of market orientation, industrial marketing and services marketing, but these are usually treated as separate bodies, without an explicit articulation with the management of the commercial risk of innovation. In fact, Zelada (2025) [32] technology marketing bibliographic research demonstrated the last paper about this matter was published by 2011 [9], a gap of more than 15 years.

Everett Rogers' diffusion of innovations theory remains the dominant framework for explaining how new ideas and technologies spread through social systems. Rogers defines diffusion as the process by which an innovation is communicated over time among members of a social system, highlighting the role of factors such as relative advantage, compatibility, complexity, observability and trialability. The S-curve model—innovators (2.5%), early adopters (13.5%), early and late majorities, and laggards—has become standard for analyzing adoption [18].

However, Rogers' theory treats resistance and market objection more as a psychological and social consequence of uncertainty than as a structural dimension of commercial risk [33]. This approach links diffusion literature with anthropological studies of fear (Fernández, Manuel; Pedrosa, José: 2008) [3], where it is argued that fear is inseparable from the experience of the unknown, providing a cultural basis for objection toward radically new technologies. Since the unknown is an epithet of innovation, by extension, so is fear.

A gap is thus observed: objection and resistance appear in diffusion literature as descriptive patterns, but they are not developed as operational variables that allow estimating, managing and reducing commercial risk from the very design of the technology marketing strategy.

The concept of commercial risk of technological innovation has been addressed in a fragmented manner in the literature of the economics of innovation (González et al (2004) [5], Williamson (1981) [26] and transaction costs. Transaction cost theory (Coase, Williamson) [2] proposes that organizations seek to minimize the costs associated with information search, negotiation, monitoring and enforcement of agreements,

which conditions the viability of economic exchanges, including the adoption of new technologies.

Nevertheless, these frameworks rarely descend to the level of operational tools that allow inventors, companies or technology centers to measure the concrete commercial risk of a given innovation. Incorporating the concept unfamiliarity / fear into the Coase & Williamson [2] approach opens an unprecedented space for defining transaction costs inherent to technological innovation [31].

4. Identified Gap and Introduction to the Document

In summary, the existing literature offers: robust definitions of technology and innovation (Oslo, Bunge, authors of philosophy of technology); consolidated frameworks of marketing and diffusion of innovations (Kotler, Rogers); partial approaches to technology marketing, commercial risk and transaction costs; but lacks an integrated system of laws that: link functionality, performance, market objection, specialization and commercial risk, and be operationalizable as a practical guide to design marketing strategies for technological innovations in multiple sectors. [13].

The 10 laws of Technological Innovation Marketing proposed in this document are situated precisely in this gap: they seek to articulate, in a coherent and applicable framework, the empirical patterns observed in more than a decade of practice with the main theoretical currents in marketing, diffusion of innovations and the economics of innovation.

A structured theoretical model composed of ten laws of Technological Innovation Marketing is thus proposed, derived from prolonged observation of real technological projects and supported by interdisciplinary literature on technology, market psychology, economics of innovation and technological diffusion. These laws articulate the relationship between functionality, performance, market objection, functional specialization and commercial risk, allowing understanding why certain innovations prosper while others fail, even when both have comparable technical merit.

5. Methodology

Due to the theoretical nature of the article, the methodology does not seek to measure statistical effects nor to carry out controlled experiments. Its purpose is to build a solid conceptual system with base on: recurrent empirical evidence, inductive reasoning, abstract formalization, validation through real cases, and internal coherence with existing theory.

This places the research within the tradition of conceptual articles, widely accepted in journals of management, marketing and innovation studies, whose primary purpose is to expand the explanatory framework of complex phenomena and provide generalizable analytical tools.

This article adopts a conceptual–inductive methodological

design, oriented to theory building from accumulated empirical evidence, specialized documentary analysis and contrast with existing theoretical frameworks in marketing, innovation and technology economics. Given that the central objective of the study is to propose and substantiate a set of universal laws that describe market behavior in the face of technological innovations, the methodology is articulated in three axes:

- 1) inductive bottom-up analysis,
- 2) comparative systematization of real cases, and
- 3) theoretical triangulation with scientific literature.

5.1. Bottom-up Approach and Inductive Analysis

The development of the ten laws was based on a process of prolonged observation of technological innovations in real market contexts. Over more than twelve years, the author compiled patterns of commercial behavior in technological projects belonging to sectors such as: biotechnology, agribusiness, mining, environmental technologies, specialized software and hardware, health and medical devices, energy and operational efficiency, applied electronics, educational technologies, among others.

These patterns were evaluated through an inductive process aimed at identifying regularities, breaking points, exceptions and recurrences that would allow inferring general principles applicable transversally. This bottom-up approach aligns with classical grounded conceptualization methodologies, where theory emerges from the systematization of accumulated empirical evidence, and not from prior abstract propositions.

5.2. Empirical Corpus and Case Systematization

The corpus analyzed includes: patented innovations, innovations in process of licensing, early validation technologies, products developed by universities, incubators and research centers, business technologies with different degrees of maturity (TRL 3–9) [30].

Each case was evaluated through standardized criteria:

- 1) core functionality,
- 2) relative performance,
- 3) detected objections,
- 4) operational constraints [19],
- 5) adoption costs,
- 6) level of specialization,
- 7) indirect or substitute competition,
- 8) transversalization possibilities.

The examples mentioned in the document—such as LASER HARP, powdered water, the tactical handcuff holder, solar heaters, USB-C chargers, medical operations without cuts, or the patented nutcracker—were integrated into the analysis as illustrative empirical units that reinforced the consistency of the detected patterns.

5.3. Documentary Analysis and Secondary Sources

The inductive process was complemented with an exhaustive documentary analysis that included: classical literature on philosophy of technology (Bunge [1], García Córdoba [4], Herrera, González et al. [6]) marketing theory and functional value (Kotler [7], Lambin [8], Levitt [9], Montesinos [14], Munuera et al [15] Santesmases [23]), diffusion of innovations theory (Rogers [20]), transaction cost theory (Coase, Williamson [2]), contemporary frameworks of technology marketing and technology transfer (Smid et al [24], Maqueda la Fuente [12] Wagner et al [25]), studies on psychological and cultural objection in the face of the unknown [3], the author's previous works such as the Structural Commercial Risk Matrix (SCR) [33] and the MDF approach [31], sector evidence from multiple industries of innovation (O'Connor et al [17], Rorke [21], Sainz de Vicuña [22]) using the competitive analysis model [19].

This theoretical triangulation made it possible to validate that the patterns observed empirically not only repeated themselves in different sectors, but also possessed coherence with the principles described in the scientific literature, which reinforces their epistemological soundness.

5.4. Theoretical Synthesis Procedure

Once the recurrent patterns were systematized and triangulated with existing theory, a structural synthesis was carried out that allowed:

- 1) Group observed phenomena according to their functional, psychological, economic and commercial nature.
- 2) Derive general principles that remained constant in the majority of analyzed cases.
- 3) Formulate the ten laws stated as universalizable propositions.
- 4) Generate causal explanations that justify why each law operates and how it relates to the others.
- 5) Integrate the laws into a coherent conceptual model, which is presented in the corresponding section.

This process followed the theory-building standards proposed by Whetten (1989) [27], where the objective is to develop conceptual models that explain relationships between variables through formalized propositions.

5.5. Transversal Validation and Model Robustness

To ensure the applicability of the laws beyond specific sectors, transversal validation was conducted: The principles were contrasted with technologies of different complexity and maturity. Consistency was verified in markets with different levels of infrastructure, technical culture and sensitivity to risk. The coherence of the model was evaluated against edge cases,

highly disruptive technologies and markets with strong operational restrictions.

The cited examples—such as solar heaters in unfavorable geography, powdered water in regulated markets, or LASER HARP in its transition from music to parking systems—confirmed the model's capacity to explain diverse and apparently unconnected phenomena.

At an expository level, the formulation of each of the marketing laws of technological innovation has been structured under the following format in five levels:

- a) Formulation of the law: in a synthetic and clear way, concise but evident.
- b) Formal statement; expands the conceptualization of the established law with well-structured information and logical order, examining the established principle in relation to valuations of its authenticity and/or modality.
- c) Conceptual foundation: specifically collects fragments of the conceptual framework presented earlier according to each law or principle.
- d) Empirical evidence and examples: provide practical grounding to validate all of the above and for the reader to validate its level of applicability.
- e) Implication: what guidelines or lessons or orientations can be derived from the laws or principles developed for the practice of Technological Innovation Marketing.

6. Conceptual and Operational Development of the 10 Laws of Technological Innovation Marketing

First Law of Technological Innovation Marketing: "The primary value of a technology is its functionality; the differential value is its performance."

Formal statement: A technology exists insofar as it fulfills a defined function. Its competitiveness, however, depends on the performance with which it executes that function in comparison with existing alternatives, which not only should be comparatively superior, but must provide relevant value for possible adopters.

Conceptual foundation: The literature on the conceptualization of technology converges in that the core of any technology is its practical know-how; therefore, functionality constitutes the starting point of its value; better or worse performance, on the other hand, determines its capacity to displace or complement previous solutions.

Empirical evidence and examples: Many readers, when they were children, played "telephone" with 02 cans joined by string, and currently, a smartphone shares the same functionality (communication at a distance), although its performance differs radically, which explains its high level of penetration in the market today.

Implication: Every technology marketing strategy must first establish and demonstrate the functionality of the proposed product (P = Product) and then measure its performance in

comparison with other pre-existing technologies. Without functionality, there is no technology; without superior performance, there is no adoption.

Second Law of Technological Innovation Marketing: "The functionality of any technology is specific and finite."

Formal statement: The functionality of any technology is specific (it is not useful for every purpose, only for that for which it was conceived) and finite (there are pre-conditions without which it loses functionality).

Conceptual foundation: Market segmentation in traditional marketing theory is born from the concept of the diversity of market needs, which is perfectly extrapolatable to functionality as an axis of value for the market.

Examples: A computer that requires a certain type of electricity to function; a biochemical reagent that loses its properties if the cold chain is broken; an engine that runs on hydrogen is useless with other fuels.

Implication: So-called "undifferentiated marketing" is a classic tenet of marketing theory, but it's impossible to apply to marketing technological innovation. Segmentation by functionality is key.

Third Law of Technological Innovation Marketing: "The focus of Marketing is to cover market needs; of Technological Innovation Marketing, it is to cover market functionalities."

Formal statement: The commercial success of an innovation depends on the degree to which the functionality it offers coincides with the functionality the market needs to execute, and in the best scenario, enhance.

Conceptual foundation: While traditional marketing is oriented toward needs, technology marketing must focus on functions. Innovation does not satisfy desires, but concrete operations that can be executed with some functional advantage.

Examples: A prospecting drone is only valuable for those who require identifying mineral veins. An agricultural micro-encapsulate only matters to markets that need controlled release of nutrients.

Implication: Market validation of a technological innovation should focus on "what is it for?", "how and why is this proposal better than others?", and "who needs to do this?", not on superficial or anecdotal attributes of the product.

Fourth Law of Technological Innovation Marketing: "The market of a technology is defined by its functionality and limited by its operational constraints."

Formal statement: A technology has a natural market derived from its function and a negative market originating in the conditions where it cannot operate due to the conditions that determine its performance.

Conceptual foundation: Every technology depends on a set of technical, material or infrastructural preconditions that determine its applicability.

Examples: A USB type C charger automatically excludes iPhone users. A solar heater lacks an operational market in areas with low radiation.

Implication: Market analysis should not focus solely on

"who could use the technology," but also on "where the technology cannot operate," which allows for setting realistic expectations about the size and location of your market, avoiding positioning errors and losses from non-returnable business investments.

Fifth Law of Technological Innovation Marketing: "Every innovation generates a market objection."

Formal statement: Given the unknown nature of innovation, the market initially responds with some type of psychological, cultural and/or cognitive resistance, with some degree of intensity.

Conceptual foundation: Anthropology of fear [3] holds that rejection is inherent to the unknown; innovation introduces precisely the unknown into the social system, so initial rejection / objection is inherent to the innovative process.

Examples: Radical medical technologies, such as surgeries without cuts, provoke initial rejection. Rejection of innovative technological concepts such as "a powdered beer" shows how the market distrusts when innovation contradicts basic intuitions about the physical world.

Implication: The objection is not an inventor's mistake; it is a structural market phenomenon that must be anticipated and strategically managed to reduce the commercial risk margin of the technology.

Sixth Law of Technological Innovation Marketing: "The degree of resistance of the objection generated by innovation is directly proportional to its degree of disruption or novelty for the market."

Formal statement: The more disruptive a technology is, the greater the resistance it faces, since in many cases it implies assuming new paradigms.

Conceptual foundation: Everett Rogers' diffusion curve shows that only 2.5% of the population is willing to adopt radical innovations immediately.

Examples: Powdered water technology generates extreme objection because it seems to contradict the traditional definition of water. It is important to note that, in this case, from Mexico, there is also a problem of misleading advertising.

Implication: The marketing strategy must budget for resistance proportional to the level of novelty; ignoring this relationship leads to failure.

Seventh Law of Technological Innovation Marketing: "The market values a technological innovation by adding the adoption cost and the functional opportunity cost of other alternatives to its own cost."

Formal statement: The market evaluates an innovation not only by its cost / price, but by the total cost it implies to adopt it, including infrastructure, training and others required for its better adoption and functioning, as well as the discarded value of substitution of alternatives.

Conceptual foundation: Institutional economics and transaction cost theory show that the costs associated with modifying productive systems strongly condition adoption decisions.

Examples: A gas stove may cost "10" but installing it may

cost "20"; the real value for the market is the sum of both. A new venoclysis technology for cattle requires veterinary training, which increases adoption cost.

Implication: Price should never be analyzed in isolation; adoption is a comprehensive economic calculation that is structured from the market adoption process.

Eighth Law of Technological Innovation Marketing: "The value the market receives from a technological innovation is directly proportional to its greater degree of functional specialization."

Formal statement: Technologies that solve critical functions with high precision generate significant value for specific niches.

Conceptual foundation: Since functionality is the minimum basis of value of a technology, a higher level of specialization of it should normally derive in better performance and therefore value for the market.

Examples: The tactical handcuff holder designed exclusively for police solves a critical operational function with total accuracy.

Implication: Specialization allows you to capture premium value, but it must be managed strategically to avoid compromising scalability.

Ninth Law of Technological Innovation Marketing: "The size of the potential market of a technological innovation is inversely proportional to its degree of functional specialization."

Formal statement: The specialization that increases perceived value simultaneously reduces the universe of potential users.

Conceptual foundation: This law derives almost naturally from the review of the first 2: functionality as the key value of technology, but at the same time, its limited or finite condition: what responds better to a given functionality, by nature, is less functional for other market segments.

Example: The tactical handcuff holder has a market limited to the police force; it cannot scale toward unrelated sectors.

Implication: Laws 7 and 8 should be interpreted as a balance between value and scope: maximizing one implies limiting the other.

Tenth Law of Technological Innovation Marketing: "Factorial deconstruction is the path to the transversalization of a technology."

Formal statement: Technological transversalization is achieved by isolating the essential functionality of the innovation from the rest of anecdotal variables and seeking new contexts where that function can operate.

Conceptual foundation: Functionality is permanent; technological forms and expressions are circumstantial.

Example: LASER HARP, initially designed as a musical instrument, was adapted to parking systems leveraging the same functionality: interruption of the light beam to generate some kind of sound or light effect.

Implication: The expansion of a technology does not de-

pend on the artifact itself, but on the ability to abstract its function and reframe it in other markets.

7. Discussion

The set of ten laws of Technological Innovation Marketing constitutes a significant theoretical contribution to the field of technology marketing and the economics of innovation, by integrating into a single conceptual framework elements that traditional literature has addressed in a fragmented manner. While theories such as Rogers' diffusion of innovations [20] focus on the sociological patterns of adoption, and the literature of classical marketing studies the generation of value from a consumer-centered approach, the ten laws propose a systemic model that explains in a structured manner the relationship between functionality, market resistance, adoption costs, functional specialization, structural competition and the possibilities of transversality.

In this sense, the laws articulate dimensions that existing literature has recognized but had not integrated into a single causal framework. The first major contribution of the model lies in repositioning functionality as the explanatory core of any technology, an approach that coincides with the philosophical tradition reviewed, but that has rarely been explicitly incorporated in technology marketing studies. This makes it possible to shift analysis from superficial attributes toward the operative essence of innovation, generating more precise conceptual tools to evaluate the commercial viability of new technologies.

Likewise, the formalization of market objection as a structural component—and not contingent—provides conceptual clarity on why technically superior technologies fail commercially. This formalization complements, but goes beyond, Rogers' postulates by linking resistance with the degree of disruption and with psychological and cultural mechanisms. Laws 4 and 5, together, establish a fundamental principle for strategy: every innovation generates objection and that objection increases with disruption. This contribution makes it possible to transform a common intuition among technologists into an explicit rule, useful for product design, early validation and adoption strategies.

Another relevant contribution of the model is the articulation between functional specialization and market size. The literature recognizes that highly specialized innovations capture value in concrete niches, but it rarely addresses this specialization as a formalizable inverse relationship. Laws 7 and 8 show that specialization is simultaneously a source of differentiation and a structural restriction. This duality, evidenced in cases such as the tactical handcuff holder, generates a valuable conceptual framework to decide whether an innovation should be oriented toward high-value, low-scale markets or whether it requires transversalization processes to broaden its reach.

Likewise, the paradox of invention—the idea that every in-

novation competes against pre-existing alternatives—introduces a realistic and necessary perspective for technological management. Although many innovations are patented and technically novel, they never enter an empty market. This law questions the myth of the “technological blue ocean” and proposes that competition must be understood in functional terms, not artifact-based. This opens new lines for the study of indirect competition and for the design of functional positioning strategies.

Finally, the incorporation of factorial deconstruction as a transversality mechanism represents one of the most original conceptual contributions of the model. By separating functionality from artifact, this law provides a methodology to reorient technologies toward new markets without needing to redesign their essence. The LASER HARP case illustrates how a technology conceived for a specific sector can scale toward completely different applications through rigorous functional analysis. This perspective complements literature on modularity, technological platforms and diversification strategy, offering an operative path for the expansion of innovations.

7.1. Evolutive Nature of the Model

A fundamental aspect of the contribution is its dynamic and evolutive character. Although this article presents ten laws, the observation process continues revealing new patterns of market behavior in the face of technological innovation. In coherence with the bottom-up approach that gives rise to the model, it is reasonable to anticipate that these laws do not represent a closed limit, but rather a current version of the conceptual framework, susceptible to expansion as a function of new evidence, emerging sectors and technological transformations.

Indeed, the original author of the framework has indicated that currently there are other laws under development, still in a phase of conceptual and empirical validation. This progressive character positions the model as a living theory, which expands and is refined with the evolution of technological practice. This methodological openness is consistent with contemporary traditions of theory building in innovation, where initial models are consolidated and enriched through successive iterations.

7.2. Implications for Academia

For academic research, this model offers a basis to develop broader studies on:

- 1) commercial risk evaluation,
- 2) functional design of innovations,
- 3) predictive models of objection,
- 4) adoption analysis in emerging markets,
- 5) functional transversalization strategies,
- 6) and new metrics of value based on functionality and performance.

The ten laws open the possibility of comparative studies between sectors, quantitative validations, econometric simulations and applications in the design of public policies for innovation.

7.3. Implications for Business and Technological Practice

For companies, incubators, transfer offices and technology developers, the model provides a concrete guide to:

- 1) anticipate market risks,
- 2) design commercial strategies aligned with the functional logic of the technology,
- 3) evaluate adoption costs integrally,
- 4) identify real opportunities for scalability or niche,
- 5) avoid errors of technological communication,
- 6) and guide diversification processes based on functionality.

In summary, the ten laws constitute a conceptual body that broadens the understanding of Technological Innovation Marketing, offering an integrated and actionable vision that is not found in prior literature. Its evolutive nature guarantees that this framework can expand as new technologies, new cases and new market dynamics arise.

8. Conclusions

- 1) The ten laws of Technological Innovation Marketing make it possible to understand commercial risk as a structural phenomenon.
- 2) The model offers a conceptual tool to anticipate objections, evaluate adoption costs and guide technological transversalization strategies.
- 3) The ten laws of Technological Innovation Marketing have demonstrated their universal character and practical application to any technology, regardless of its complexity or area of human knowledge.
- 4) Given its evolutive character, these laws represent a current version that can be expanded in future research.
- 5) The document strengthens the conceptual frameworks on which the "*Technological Marketing Tool Series*" papers were developed (Zelada: 2024; 2025b; 2025c) and is fed back by them, tending to shape a more comprehensive theoretical and practical corpus.

Abbreviations

MDFF Market Driven Fit

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Author Contributions

Fernando Zelada Briceño is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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Biography



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