

Strategic Marketing as a Complementary Framework for Technology Commercialization and Innovation Management - Technological Marketing Theory Series #02

El marketing estratégico como marco complementario para la comercialización de tecnología y la gestión de la innovación - Serie Teoría del marketing tecnológico #02

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The persistent commercial failure of technological innovations remains a major challenge for innovation ecosystems. Although marketing-related activities are recognized in innovation research, their systematic articulation as a strategic and operational framework for analyzing commercial risk throughout technology commercialization and transfer remains fragmented. This study examines the functional correspondence between selected concepts from Strategic Marketing, technological innovation management, and technology commercialization, and explores the explanatory contribution of Lambin's Market-Driven Management

model to factors associated with the commercial failure of technological innovations. A sequential mixed-method design combines comparative conceptual analysis of the Innovation–Marketing and Technology Transfer–Commercial Exchange pairs with multiple linear regression analysis based on secondary international evidence and technological audit records. The findings indicate a consistent functional correspondence between the selected constructs. The quantitative analysis shows that the joint consideration of Strategic and Operational Marketing dimensions is associated with a substantial share of the historical variation in commercial technological failure (adjusted $R^2 = 0.77$). The study does not claim causal exclusivity: institutional, regulatory, technological, financial, and national innovation-system conditions also affect commercialization outcomes. The article positions Strategic Marketing as a complementary analytical framework that can strengthen market-oriented decision-making and help reduce commercialization risk.

Keywords: strategic marketing, innovation management, technology transfer, technological innovation marketing, commercial technological risk

El persistente fracaso comercial de las innovaciones tecnológicas sigue siendo un desafío importante para los ecosistemas de innovación. Si bien las actividades relacionadas con el marketing se reconocen en la investigación sobre innovación, su articulación sistemática como marco estratégico y operativo para analizar el riesgo comercial en la comercialización y transferencia de tecnología sigue fragmentada. Este estudio examina la correspondencia funcional entre conceptos seleccionados del marketing estratégico, gestión de la innovación tecnológica y comercialización de tecnología, y explora la contribución explicativa del modelo de gestión orientada al mercado de Lambin a los factores asociados con el fracaso comercial de las innovaciones tecnológicas. Un diseño secuencial de métodos mixtos combina el análisis conceptual comparativo de los pares Innovación-Marketing y Transferencia de Tecnología-Intercambio Comercial con un análisis de regresión lineal múltiple, basado en evidencia internacional secundaria y registros de auditoría tecnológica. Los hallazgos indican una correspondencia funcional consistente entre los constructos seleccionados. El análisis cuantitativo muestra que la consideración conjunta de las dimensiones de marketing estratégico y operativo se asocia con una parte sustancial de la variación histórica en el fracaso tecnológico comercial (R^2 ajustado = 0,77). El estudio no afirma una exclusividad causal: las condiciones institucionales, regulatorias, tecnológicas, financieras y del sistema nacional de innovación también afectan los resultados de la comercialización. El artículo presenta el marketing estratégico como un marco analítico complementario que puede fortalecer la toma de decisiones orientada al mercado y ayudar a reducir el riesgo de comercialización.

Palabras clave: marketing estratégico, gestión de la innovación, transferencia tecnológica, marketing de la innovación tecnológica, riesgo comercial tecnológico

1. Introduction

During the last few decades, Research, Development, and Innovation (R+D+i) ecosystems have steadily increased their scientific, technological, and financial capabilities. However, this growth has not translated into a proportional improvement in the commercial success rates of the developed technologies. Various studies show that a high proportion of innovations fail to achieve sustained market adoption, even after satisfactorily passing the stages of research, development, or technological validation (Cooper, 2017; CB Insights, 2024; OECD/Eurostat, 2018).

The literature does not ignore marketing in innovation. The Oslo Manual recognizes marketing innovation as a type of business innovation, while research on market orientation has long examined the generation, dissemination, and response to market intelligence (Kohli & Jaworski, 1990; Narver & Slater, 1990). Likewise, technology-commercialization practice encompasses market assessment, business-case development, intellectual-property marketing, licensing, product development, and market dissemination (WIPO, 2026). The gap addressed here is therefore narrower: the fragmented use of Strategic Marketing as an integrated, strategic and operational analytical lens for interpreting commercial risk in technology commercialization and transfer.

Innovation scholarship has emphasized technological maturity, funding, organizational capabilities, governance, diffusion, and transfer mechanisms (Rogers, 2003; Chesbrough, 2003; Cooper, 2017). Marketing scholarship, in turn, has developed concepts for need identification, segmentation, competitive analysis, value propositions, adoption, and exchange. These bodies of knowledge are complementary, but they are frequently brought together only at later stages of commercialization.

This gap is highly relevant because numerous activities currently integrated into innovation management—such as needs identification, market segmentation, competitive analysis, value proposition development, technology adoption, and knowledge commercialization—correspond to concepts developed in the marketing literature several decades before the consolidation of innovation management as an academic discipline (Cherington, 1920; Kotler, 1967; Stanton et al., 2007; Lambin et al., 2009).

This article focuses on the market-facing dimensions of technological innovation rather than on all determinants of innovation performance. It does not equate marketing failure with overall technology-transfer failure, nor does it assume that public and private organizations face identical barriers. National innovation-system conditions, institutional incentives, regulation, financing, absorptive capacity, and regional industrial structure can be decisive, particularly for publicly generated technologies.

The research question is: Do selected concepts that structure technological innovation management and technology commercialization present a functional correspondence with Strategic Marketing principles, and does the joint consideration of strategic and operational marketing dimensions help explain factors historically associated with commercial failure of technologies?

To answer this, the study is developed in two complementary phases:

- **First Phase:** Conducts a syntactic-comparative analysis of the main concepts of innovation management and their functional equivalents in marketing.

- **Second Phase:** Empirically evaluates the explanatory capacity of Lambin's Market-Driven Management model through multiple regression analysis based on secondary information and technological audit records.

Together, the results allow us to examine the existence of a conceptual correspondence between both disciplines and assess the contribution of Strategic Marketing as an analytical framework for understanding the factors associated with the commercial performance of technological innovations, as well as its potential to strengthen technology transfer processes.

The study contributes by integrating conceptual comparison with exploratory quantitative evidence. It proposes Strategic Marketing as a complementary framework for technology commercialization, not as a substitute for innovation-management theory, technology policy, or national innovation-system analysis.

2. Theoretical Framework

2.1. Marketing, Market Orientation, and Innovation

Marketing should be differentiated from marketing innovation. Marketing innovation refers to the implementation of a new marketing method; Strategic Marketing, by contrast, concerns the analysis of needs, segments, competitors, value propositions, and long-term market choices. Operational Marketing translates these choices into product, price, distribution, and communication decisions (Lambin, Gallucci, & Sicurello, 2009; Kotler & Armstrong, 2018). This distinction addresses the concern that recognition of marketing innovation in the Oslo Manual already resolves the problem addressed by this article: it does not, because the present analysis concerns a broader decision framework rather than a single innovation category.

Technological innovation management consolidated as a field of study during the second half of the 20th century, driven by the development of national innovation systems, the strengthening of technology transfer mechanisms, and the growing economic importance of knowledge (Rogers, 2003; Chesbrough, 2003; OECD/Eurostat, 2018). Its evolution gave rise to various methodologies aimed at increasing the probability of adoption and commercial success of innovations.

In parallel, marketing began its conceptual development several decades earlier. Following the contributions of Shaw (1916) and Cherington (1920), it evolved from a focus centered on exchange toward models of strategic market analysis and value creation. Subsequently, Kotler (1967) consolidated the Marketing Management paradigm, while Lambin et al. (2009) expanded this perspective through the Market-Driven Management model, distinguishing two complementary dimensions: Strategic Marketing and Operational Marketing.

Strategic Marketing comprises needs identification, market segmentation, competitive analysis, and the formulation of long-term strategies, whereas Operational Marketing transforms these decisions into commercial actions through product, price, place (distribution), and promotion (communication) management (Lambin et al., 2009; Kotler &

Armstrong, 2018). Both dimensions are complementary and constitute a framework for understanding the relationship between the organization, the market, and value generation.

According to Lambin et al. (2009), the integration of both dimensions is indispensable for reducing commercial risk. An operational execution without a strategic foundation tends to generate technically viable products that are disconnected from market needs, while a strategy without effective implementation rarely produces results. Consequently, analyzing the commercial performance of innovations requires considering both dimensions as independent yet complementary factors.

In turn, innovation literature incorporates concepts with equivalent functions within the technological generation and adoption process. The Oslo Manual defines innovation as the effective introduction of a new or significantly improved product or process (OECD/Eurostat, 2018), while the Association of University Technology Managers (AUTM) defines technology transfer as the process through which research results are transformed into products and services with economic and social impact (AUTM, 2024).

Market-orientation research reinforces this positioning. Kohli and Jaworski (1990) describe market orientation as organization-wide intelligence generation, dissemination, and responsiveness; Narver and Slater (1990) emphasize customer orientation, competitor orientation, and interfunctional coordination. Evidence also suggests that market and technology orientations interact rather than compete: market orientation may support technology-based innovations, while organizational context shapes the nature of this relationship (Zhou et al., 2005). Thus, the article does not claim that technological development should be subordinated to marketing. It argues that market-facing capabilities must be integrated with technological capabilities when commercial outcomes are at stake.

Recently, Zelada (2026) formulated a series of marketing principles for technological innovation, taking into account buyer behavior in contexts characterized by nuanced supply with uncertainty.

On this basis, the present study analyzes whether the main constructs of Technological Innovation Management present a conceptual convergence with the foundations of Strategic Marketing and whether this convergence helps explain part of the factors associated with the commercial performance of innovations.

The present study is grounded in a core body of foundational literature comprising the works of Shaw (1916), Cherington (1920), Kotler (1967), Rogers (2003), Chesbrough (2003), Lambin et al. (2009), the Oslo Manual (OECD/Eurostat, 2018), and Cooper (2017). Collectively, these contributions trace the evolution of thinking on marketing, innovation, technology transfer, and market orientation, providing the conceptual framework that underpins the analysis developed in this study.

2.2. Technology Commercialization, Transfer, and Market Intelligence

Technology transfer converts inventions, scientific knowledge, and research results into applications with economic or social value. It can occur among universities, firms, public entities, and across national borders. Transfer includes, but is not limited to, licensing, collaborative development, spin-offs, contractual arrangements, and knowledge exchange.

Technology transfer should not be reduced to a conventional sale. It is better understood as a specialized exchange and coordination process involving technology owners, adopters, intermediaries, intellectual-property arrangements, development commitments, and final markets. Selling and technology transfer share an exchange structure, but transfer also includes valuation, rights allocation, adaptation, absorptive capacity, and post-transfer development. This qualification preserves the functional comparison while avoiding an overstated equivalence.

Technology intelligence and foresight are relevant upstream complements. They help identify technological trajectories, application fields, competitors, partners, and emerging needs; Strategic Marketing uses related market intelligence to choose segments, articulate value propositions, and design routes to adoption. Together, these practices can improve commercialization decisions without eliminating contextual constraints.

Servitization provides a complementary perspective for understanding the market-facing transformation of technological offerings. Originally defined as the transition from product-centered businesses toward integrated product-service offerings, servitization emphasizes value-in-use, customer relationships, and the organizational capabilities required to commercialize complex solutions (Vandermerwe & Rada, 1988; Baines et al., 2009). More recent research on digital servitization shows that digital technologies can strengthen this transition by enabling data-driven services, lifecycle management, and new solution-oriented business models (Paschou et al., 2020; Favoretto et al., 2022). From the standpoint of technological innovation management, servitization innovation illustrates how technological value is not fully realized through the technical artifact alone, but through the integration of market needs, complementary services, delivery mechanisms, and adoption processes (Xing et al., 2023). Zelada (2024) analyzes the transaction costs and barriers to entry associated with technological innovation, drawing on some of the arguments proposed by Xing et al. and adopting a perspective focused on problem resolution and strategic reorientation. These perspectives are consistent with the present study's argument that Strategic Marketing can contribute to reducing commercial risk. However, servitization is not operationalized as an independent variable in the present model and is therefore considered a complementary theoretical perspective rather than an explanatory construct.

2.3. Contextual Determinants of Commercialization

Commercial outcomes are multicausal. In addition to market-related factors, technology commercialization can be affected by technological readiness, intellectual-property quality, organizational capabilities, public-policy instruments, funding, regulation, culture, and the structure of the national or regional innovation system. The model developed below deliberately addresses only a subset of commercial-risk factors. Its findings must therefore be interpreted as complementary associations, not as a complete account of technology-transfer outcomes.

3. Research Hypotheses

The present research poses two complementary hypotheses:

Hypothesis 1 (H1): Selected concepts of Technological Innovation Management and technology commercialization exhibit a consistent conceptual and functional correspondence with Strategic Marketing principles.

H1 is restricted to the selected concepts and dimensions examined in the comparative matrix. It does not posit disciplinary identity, historical priority, or theoretical dependence between Innovation Management and Marketing.

Hypothesis 2 (H2): The joint consideration of Strategic Marketing and Operational Marketing variables is significantly associated with a substantial share of the factors historically associated with commercial failure of technological innovations.

H2 is exploratory and associational. It does not establish that these marketing dimensions are the sole or causal determinants of commercial failure.

These hypotheses do not seek to establish absolute causal relationships between Strategic Marketing and Innovation Management. Rather, their purpose is to examine the conceptual consistency and explanatory capacity of an integrated analytical framework that provides a complementary perspective for interpreting the processes associated with technological innovation management.

4. Methodology

4.1. Research Design

The study adopted a sequential mixed-method design with two articulated phases. First, a comparative conceptual analysis examined functional correspondences between selected innovation- and marketing-related constructs. Second, an exploratory multiple linear regression model evaluated the explanatory contribution of two macro-constructs derived from the Market-Driven Management model.

4.2. Phase 1: Comparative Conceptual Analysis

Two conceptual pairs were selected because they represent market-facing dimensions of the innovation ecosystem: Innovation-Marketing and Technology Transfer-Commercial Exchange. Definitions were obtained from the Oslo Manual (OECD/Eurostat, 2018), the American Marketing Association (2017), AUTM (2024), and marketing literature. Each definition was decomposed into five dimensions: subject, principal action, object, recipient, and purpose. The analysis evaluates functional correspondence, not terminological identity.

This procedure made it possible to compare the functional structures of the concepts while avoiding limiting the analysis to terminological similarities. Consequently, the evaluation focused on the function that each concept performs within its respective disciplinary body.

The analyzed definitions were obtained exclusively from institutional documents and widely accepted literature within each knowledge area, including the Oslo Manual

(OECD/Eurostat, 2018), the American Marketing Association (2017), the Association of University Technology Managers (2024), and the UNE 166006 standard (UNE, 2018).

4.2. Second Phase: Quantitative Analysis

To test Hypothesis 2, a multiple linear regression model was used, based on secondary information and technological audit records. The model considers the historical behavior associated with the commercial failure of technological innovations as the dependent variable. As independent variables, two macro-constructs derived from Lambin's Market-Driven Management model were incorporated:

Table 1. Macro-Independent Variables and Their Operationalization

Macro-Independent Variable	Description	Components
Strategic Marketing (X₁)	Represents the analytical dimension prior to the commercial development of the innovation. It incorporates three components	• Market segmentation • Competitive analysis • Development strategy
Operational Marketing (X₂)	Represents the commercial execution dimension and comprises the traditional variables of the marketing mix	• Product • Price • Distribution (Place) • Communication (Promotion)

Note. Source: Authors' own elaboration (2026), based on Lambin's theoretical frameworks (1994, 2008).

The general model is expressed through the following equation:

$$Y = \beta_0 + \beta_1(X_{Estrategic}) + \beta_2(X_{Operational}) + e$$

Where:

- Y represents the historical commercial failure rate.
- X1 corresponds to Strategic Marketing.
- X2 represents Operational Marketing.
- e corresponds to the random error term.

Transparency Clarification. The evidence base combines: (a) aggregated historical failure categories reported by CB Insights; (b) institutional technology-transfer statistics and definitions from AUTM; and (c) 32 technological audits performed through the Market Driven Fit methodology. These sources serve complementary purposes and are not equivalent to individual-level observations. The model is therefore presented as an exploratory aggregation of coded commercial-risk categories and audit evidence, rather than as a population estimate. The study does not claim complete methodological triangulation; interviews, case studies, and primary longitudinal data could provide appropriate avenues for future triangulation.

4.3. Information Sources

The database used in this study integrates three complementary sources of information:

1. International reports on the causes of business failure prepared by CB Insights (2024).

2. Institutional statistics published by the Association of University Technology Managers (AUTM, 2024).
3. Results of thirty-two technology audits conducted using the Market Driven Fit methodology (Zelada, 2024).

The three sources were selected for their complementarity. While international reports provide aggregated evidence on the causes of commercial failure, technological audits allow these findings to be examined against evidence from actual technology evaluation processes.

It is worth mentioning that efforts were made to work with databases harmonized with the Oslo Manual, such as Eurostat's Community Innovation Survey (CIS), in which the Innovation Barriers block is relatively well-structured but lacks the depth of variables available in CB Insights.

A review of the principal market- and commercialization-related obstacles used as analytical categories in the most recent Community Innovation Survey (CIS) rounds (CIS 2018 and CIS 2020) indicates that the market is conceptualized as an external entity, separate from the innovating organization. It is characterized through three variables whose presence is assessed using a dichotomous approach. From this perspective, the CIS framework largely excludes the roles of managerial action, strategic decision-making, and market-oriented management by innovation actors. Consequently, the market is treated as a given external condition to which firms must adapt, rather than as a domain that can be systematically analyzed to formulate and implement any strategy,

4.4. Operationalization and Coding of Variables

The causes of failure identified across the different sources were classified using a dichotomous coding system and subsequently grouped according to the dimensions proposed by Lambin. The first macro-construct corresponds to Strategic Marketing, integrating indicators related to unidentified demand (No Market Need), competitive pressure (Outcompeted), and market timing errors (Bad Timing). The second macro-construct groups variables corresponding to Operational Marketing: product performance, adoption costs, distribution structure, and commercial communication.

The detailed operationalization of these indicators is presented in Table 2, specifying the variables used to construct the statistical model.

Table 2. Consistency and Operationalization Matrix of Secondary Variables

Macro-Independent Variable	Operational Indicators / Variables	Mapping to Failure Categories Reported in the Literature
Strategic Marketing (X_1)	M_1 : Deficiency in Segmentation	Lack of clearly identified market demand (No Market Need; CB Insights, 2024).
	M_2 : Myopia in Competitive Analysis	Presence of superior substitutes or an absence of defensible competitive advantages (Outcompeted; CB Insights, 2024).
	M_3 : Error in Development Strategy (Timing)	Misalignment with the market life cycle (Bad Timing; CB Insights, 2024).
Operational Marketing (X_2)	P_1 : Failure in Product Dimension	Usability and maturity limitations in the real operating environment.
	P_2 : Failure in Price Dimension	Unforeseen adoption costs and transaction costs (Zelada, 2025).
	P_3 : Failure in Place Dimension (Distribution)	Absence of contractual and commercial articulation between TTO (OTRI) and the firm
	P_4 : Failure in Promotion Dimension	Weaknesses in information tools and the sales force.

Note. Source: Authors' own elaboration (2026), based on Zelada's theoretical framework (2026 and CB Insights data (2024).

5. Results

The two approaches developed in the study, conceptual and quantitative, were integrated with the purpose of analyzing whether the evidence obtained converges toward a consistent interpretation of the studied phenomenon.

5.1. Functional Correspondence: Innovation and Marketing

The comparison indicates a functional correspondence between the selected concepts. Innovation concerns the implementation of a new or significantly improved product or process; marketing encompasses activities through which offerings are created, communicated, delivered, and exchanged. Both involve an offering, an external recipient, and a process through which value is recognized and adopted.

5.1.1. Innovation and Marketing

The comparison between the definition of innovation proposed by the Oslo Manual (OECD/ Eurostat, 2018) and the official definition of Marketing provided by the American Marketing Association showed that both concepts describe processes oriented toward the generation and adoption of value.

Table 3. Comparative Syntactic Analysis: Innovation vs. Marketing

Dimension of Analysis	Innovation	Marketing	Relationship Analysis
Nature of the concept	Result embodied in a product or process.	Activity, set of institutions, and processes oriented toward a result.	Result vs. system of activities leading to that result .

Main object	Product, process, or combination thereof.	Offering of goods or services.	To be innovative, a substantively improved product must constitute an offering.
Main action	Develop and implement products, processes, or services.	Create, communicate, deliver, and exchange offerings.	Functionally, "developing" and "creating" are synonymous.
Implementation	Introduced to the market or put into use.	Exchanged with the market (= buying/selling action).	Both require commercial execution, where introduction = buying/selling.
Expected result	Implemented or adopted innovation.	Generation of exchanged value.	Both require commercial execution, where adoption = buying/selling.

Note. Source: Authors' own elaboration (2026), based on the comparative syntactic deconstruction of the Oslo Manual guidelines (OECD/Eurostat, 2018) and the official definition of marketing provided by the American Marketing Association (AMA) (2017).

The result should be read as a functional convergence rather than equivalence. Innovation management includes scientific, technical, organizational, and institutional tasks that exceed marketing. Marketing, in turn, does not define the technological novelty or feasibility of an offering. Their correspondence lies in selected market-facing functions.

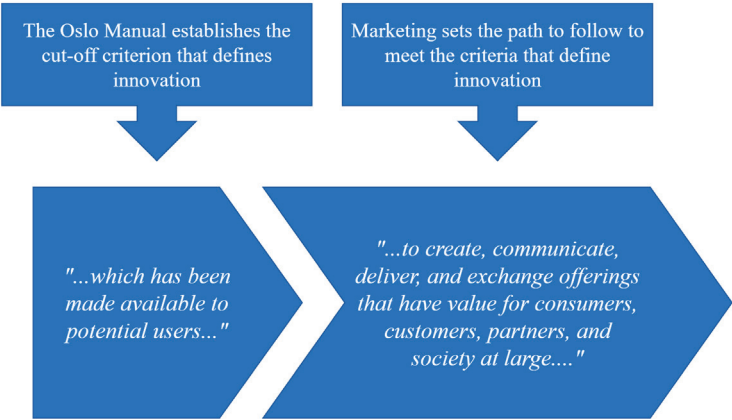
While innovation is defined as the effective introduction of a new or significantly improved product or process, marketing describes the set of activities through which value is created, communicated, delivered, and exchanged—a sequence clearly oriented toward achieving the stated effective introduction.

Although both concepts stem from different perspectives, the syntactic comparison shows a functional convergence in three main dimensions:

- They are structured around a transformation process whose expected outcome is the adoption of an offering by a user.
- They require the existence of an external recipient whose response determines the success of the process.
- They implicitly incorporate the notion of value creation as a necessary condition to achieve that result.

In consequence, innovation can be interpreted as the material result of the value generation process, while marketing represents the organizational architecture that allows that value to be recognized, accepted, and finally adopted by the market

Figure 1. Sequential Conceptual Model of the Innovation - Marketing Symbiosis



Note. Source: Authors’ own elaboration (2026), based on the comparative syntactic deconstruction of the Oslo Manual guidelines (OECD/Eurostat, 2018) and the official definition of Marketing provided by the American Marketing Association (2017)

5.1.2. Technology Transfer and Selling

The second comparison examined the definition of technology transfer provided by the Association of University Technology Managers (AUTM) and various Latin American frameworks in relation to the concept of selling developed by Stanton, Kotler, and Lambin.

The AUTM (2024) establishes that technology transfer is:
"The process of transferring (disseminating) technology from the person or organization that owns it to another person or organization, with the intent of transforming inventions and scientific hypotheses into commercial products and services that benefit society."

Lambin et al. (2009) approach the concept from a strategic and operational marketing perspective. According to this, selling is the operational activity through which the commercial strategy is implemented, connecting the firm's offering with market demand:

"Selling is the operational marketing tool responsible for organizing direct contact with buyers, presenting products, negotiating sales conditions, and ensuring order execution, with the objective of making the chosen market share profitable."

Breaking down the grammar of both concepts reveals almost exact structural parallelisms:

Table 4. Structural Alignment: Technology Transfer vs. Selling

Syntactic Component	Technology Transfer (TT)	Selling / Sales Activity	Match Analysis
Source Subject	Person or organization that owns it (University/TTO = Technology Managers).	The salesperson / The sales force.	Both represent the sender/possessor of the asset.
Central Action (Verb)	Transfer / Disseminate (delivering ownership/ use).	Persuade to buy / Exchange.	Both verbs imply moving the asset from origin to destination.
Object of the Action	Technology / Inventions / Scientific results.	"Something" (A product, service, or idea).	The technology in TT is the packaged "something" of the sale.

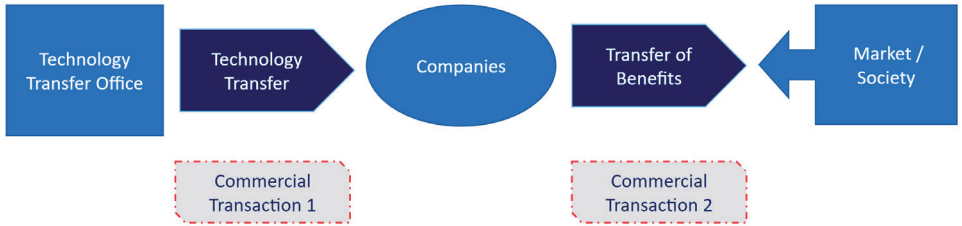
Destination Subject	Another person or organization (Company/ User).	Someone / The buyer.	Bidirectional focus toward a receiving third party.
Purpose (The what for)	Transform into commercial products / Benefit.	Satisfy needs / Achieve mutual benefit.	Both seek a final utility that justifies the movement.

Note. Source: Author's own elaboration (2026), based on the comparative syntactic deconstruction of the AUTM (2024) guidelines and Lambin's theoretical frameworks (1994, 2008).

Syntactically, Technology Transfer and Selling share several transactional elements: *Sender (A) transfers Asset (X) to Receiver (B) through a mechanism of persuasion and agreement, generating a commercial economic exchange.* Consequently, the results suggest that technology transfer can be interpreted as a specialized exchange process whose transactional object is technological knowledge, a concept that fits perfectly into the sales variable, which is part of the Promotion component of Operational Marketing.

Furthermore, analyzing the AUTM definition adds a second conceptual layer of marketing by noting: *"...with the intent of transforming inventions and scientific hypotheses into commercial products and services..."*. Since this describes a derived demand process in a consumer–firm–TTO sequence, it is evident that not only is Technology Transfer commercial in nature, but its ultimate goal is to achieve a second, successive derived commercial act that allows the benefits of technological adoption to reach society (naturally, through an improved/enhanced product or service). In this way, it becomes clear that the concept of Technology Transfer implies a double commercial transaction.

Figure 2. Double Commercial Transactions in Technology Transfer



Note. Source: Author's own elaboration (2026), based on the comparative syntactic deconstruction of the AUTM (2024).

5.3. Quantitative Analysis Results

The second phase of the research examined the explanatory capacity of the integrated Market-Driven Management model through a Multiple Linear Regression analysis based on secondary information and technological audit records. As established in the methodology, the model incorporated two independent macro-constructs: Strategic Marketing and Operational Marketing.

The statistical processing yielded an adjusted coefficient of determination (Adjusted $R^2 = 0.77$), indicating that the model explains a substantial proportion of the variability observed in the historical causes of commercial failure of technological innovations.

The block corresponding to Strategic Marketing presented the highest relative weight ($\beta = 0.54$; $p < 0.01$), while Operational Marketing maintained an independent and statistically significant effect ($\beta = 0.33$; $p < 0.05$). These results indicate that

both dimensions contribute in a complementary manner to explaining the commercial performance of innovations. The statistical results are summarized in Table 5

Table 5. Multiple Linear Regression Model Results

Macro-Independent Variable	Coded Taxonomic Indicator	% Historical Incidence in Literature	Net Beta Coefficient (β)	Significance (p-value)
Strategic Marketing X_1	M₁ : Deficiency in Segmentation	42%	$\beta_1 = 0.54$	p<0.01
	M₂ : Myopia in Competitive Analysis	19%		
	M₃ : Error in Development Strategy (Timing)	10%		
Operational Marketing X_2	P₁ : Failure in Product Dimension	8%	$\beta_2 = 0.33$	p<0.05
	P₂ : Failure in Price Dimension	15%		
	P₃ : Failure in Place Dimension (Distribution)	14%		
	P₄ : Failure in Promotion Dimension	11%		

Note. Source: Authors' own elaboration (2026), based on thirty-two technological audits using the Market Driven Fit methodology (Zelada, 2024) and historical failure data from CB Insights (2024) and AUTM (2024).

Consequently, the quantitative evidence is consistent with Hypothesis 2. It is important to note that this mathematical behavior rules out theoretical subordination bias, demonstrating that the failure of a technology is not restricted solely to strategic misreadings of demand. Failures in articulating commercial channels by technological centers or the misalignment of the transfer price due to the omission of hidden transaction costs for the adopting firm (Zelada, 2025) operate as value-destroying forces with independent explanatory capacity within commercial risk.

5.4. Convergence of Evidence

The main contribution of this research lies in the convergence between the conceptual analysis and the statistical model. While the former identifies a structural correspondence between the main constructs of Technological Innovation Management and Strategic Marketing, the latter demonstrates that Lambin's integrated model explains a significant proportion of the factors historically associated with the commercial failure of innovations.

In combination, both approaches indicate that Strategic Marketing principles do not merely constitute tools for technology commercialization, but also provide an analytical framework capable of contributing to the understanding of knowledge generation, evaluation, and transfer processes. Consequently, the evidence supports the central thesis of the study and provides a foundation for analyzing the theoretical and practical implications derived from this conceptual and empirical convergence.

These estimates should be interpreted as exploratory associations within the constructed model. They do not establish causal exclusivity, nor do they imply that marketing-related variables outweigh technological, institutional, regulatory, financial, or national innovation-system conditions that may also affect technology commercialization

outcomes. The present analysis deliberately delimits its scope to the market-related dimensions specified in the hypotheses. Therefore, the findings indicate the explanatory relevance of Strategic and Operational Marketing within this defined analytical framework, while other potentially influential conditions remain beyond the scope of the model and should be examined in future multilevel and longitudinal research.

6. Discussion

The results obtained allow for an interpretation of the relationship between Strategic Marketing and Technological Innovation Management from a different perspective than the one that predominates in specialized literature. Traditionally, both disciplines have evolved as relatively independent fields, establishing points of intersection mainly during the final stages of innovation commercialization. However, the conceptual and quantitative evidence presented in this study suggests that this relationship could be deeper and could begin from the earliest phases of formulating a novel product that may ultimately culminate in an innovation.

The conceptual and quantitative evidence converges on a limited but useful proposition: Strategic Marketing offers a complementary analytical language for examining market-related decisions in technology commercialization. It should not be interpreted as an alternative to innovation-management theory or as a universal explanation for transfer outcomes.

From this perspective, the findings are consistent with the Market-Driven Management approach proposed by Lambin et al. (2009), according to which understanding the market constitutes a parallel process to developing the offering rather than a post-innovation activity. Likewise, the evidence is consistent with the propositions of Narver and Slater (1990) and Day (1994), who maintain that market orientation constitutes an organizational capability associated with sustainable competitive performance.

The contribution is threefold. First, it distinguishes Marketing Innovation from Strategic Marketing as a decision framework. Second, it treats technology transfer as a specialized commercialization and coordination process rather than as a simple sale. Third, it empirically explores the joint relevance of strategic and operational market dimensions for commercial-risk factors. These clarifications delimit the article's claim and make its interdisciplinary contribution more precise.

The quantitative results complement this interpretation. The explanatory capacity achieved by the integrated model of Strategic Marketing and Operational Marketing indicates that both dimensions contribute concurrently to explaining an important proportion of the causes historically associated with the commercial failure of innovations. Particularly, the greater weight observed in strategic variables is consistent with research identifying the absence of clearly defined needs, competitive pressure, and the timing of market entry as recurring failure factors (CB Insights, 2024; Cooper, 2017).

In short, the results allow for broadening the traditional interpretation of marketing within innovation processes. Rather than a tool oriented exclusively toward commercializing already developed technologies, Strategic Marketing can be understood as an analytical framework that helps guide decisions from the initial stages of opportunity identification,

needs evaluation, segment selection, and value proposition design. This interpretation does not alter the foundations of Technological Innovation Management; instead, it proposes a conceptual articulation with a previously consolidated theoretical body with which it demonstrates a symbiotic relationship.

The practical implications of this integration are also relevant. The systematic incorporation of Strategic Marketing tools during the early stages of technology evaluation could strengthen project prioritization, reduce uncertainty associated with adoption, and improve resource allocation for technology transfer. Similarly, maintaining Operational Marketing variables as independent components of the model confirms that market understanding alone does not guarantee the commercial success of an innovation if it is not accompanied by adequate execution of commercial decisions.

Consequently, the evidence obtained suggests that articulation between both disciplines can constitute a promising line of research to understand more precisely the factors conditioning the commercial performance of technological innovations and to strengthen the models currently used by R+D+i ecosystems. For instance, the mechanisms and methodologies for measuring the problems causing innovations to fail due to commercial or market issues deserve a closer approach and open a crucial line of reflection and research for a better understanding of the subject.

For publicly originated technologies, these market-related dimensions interact with system-level barriers. Weak institutional incentives, limited commercialization capabilities, regulatory constraints, scarcity of risk capital, and low firm absorptive capacity can impede transfer even when market analysis is sound. Future studies should test the framework across university, public-research, corporate, and start-up settings, and include contextual variables at organizational and national-system levels.

7. Limitations of the Study

The quantitative analysis relies on secondary information and available audit records. The sources are complementary but heterogeneous, and the results cannot establish definitive causal relationships. Constructing macro-constructs required coding and conceptual aggregation, which may simplify differences among technologies and innovation contexts.

The study does not use interviews, field observations, or a longitudinal primary database. Accordingly, it should not be described as involving full methodological triangulation. Future research can combine the present coding logic with multi-case studies, interviews with technology-transfer offices and adopting firms, and longitudinal commercialization data. The analysis also excludes several potentially important institutional, regulatory, cultural, financial, and macroeconomic conditions.

These estimates should be interpreted as exploratory associations within the constructed model. They do not establish causal exclusivity, nor do they imply that marketing-related variables outweigh technological, institutional, regulatory, financial, or national innovation-system conditions that may also affect technology commercialization outcomes. The present analysis deliberately delimits its scope to the market-related dimensions specified in the hypotheses. Therefore, the findings indicate the explanatory relevance of Strategic and Operational Marketing within this defined analytical framework,

while other potentially influential conditions remain beyond the scope of the model and should be examined in future multilevel and longitudinal research.

Finally, the research focuses primarily on conceptual analysis and theoretical integration between disciplines. Future research could expand the model by employing primary databases, longitudinal studies, and comparative analyses across different national innovation ecosystems, allowing for the testing of the robustness of the proposed framework in diverse organizational contexts.

8. Conclusions

This study examined the possible conceptual correspondence between the key principles of Technological Innovation Management and those previously developed by Strategic Marketing theory. It also researched the explanatory capacity of the Market-Driven Management model in relation to the commercial failure of technological innovations.

The evidence obtained through the conceptual analysis showed that innovation and technology transfer processes maintain a consistent functional correspondence with concepts extensively developed by Strategic Marketing theory. This convergence manifested in aspects related to needs identification, value generation, exchange, information gathering for decision-making, and the market adoption of solutions. Consequently, the results are consistent with the first hypothesis raised and support the existence of a conceptual underlying nature between both disciplinary bodies.

Complementarily, the quantitative analysis revealed that integrating Strategic Marketing and Operational Marketing dimensions significantly explains the variability observed in the historical causes of commercial failure in technological innovations. Estimating the model revealed that both dimensions maintain independent and complementary effects, suggesting that the commercial performance of an innovation depends both on the quality of the prior strategic analysis and on the capacity to execute commercial decisions adequately.

From a theoretical perspective, the results prompt a reconsideration of the role of Strategic Marketing within Technological Innovation Management. Rather than a tool applicable solely during technology commercialization, the presented evidence is consistent with interpreting it as a conceptual framework that can contribute to the understanding of processes present from the initial stages of opportunity identification, needs evaluation, and development strategy design.

From an applied perspective, the explicit incorporation of segmentation tools, competitive analysis, needs validation, and value proposition design during the first phases of innovation could strengthen technological evaluation, improve articulation between knowledge-generating and knowledge-adopting organizations, and contribute to reduce the commercial risk associated with technology transfer.

The central conclusion is deliberately bounded: Strategic Marketing can serve as a complementary framework for reducing market-related commercialization risk, but it cannot replace technological assessment, institutional capability, financing, regulation, or innovation-system conditions. This framing strengthens the article's theoretical contribution while preserving its practical relevance for universities, technology-transfer offices, firms, and innovation-policy stakeholders.

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