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Dual business models integrating customer collaboration and commercialization in SMEs

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Abstract: Small and medium sized enterprises (SME) increasingly rely on customer collaboration to support innovation, particularly in business-to-business (B2B) contexts where solutions must be adapted to complex and evolving user need.

While many SMEs collaborate for exploring innovation, they struggle to convert this knowledge simultaneously to ensure exploitation into profitability. This paper examines how SME combines customer collaboration and market commercialization through a dual business model.

Ambidexterity research stresses balancing exploration and exploitation but weakly explains dynamical integration.

Drawing on a longitudinal case study in the chemical industry, the findings show that collaboration-based business models support opportunity exploration, co-creation and product adaption with selected customers, while market-based business models enable exploitation and efficient value capture. Cross-functional teams act as boundary mechanisms translating external customer interaction into internal interaction.

The study contributes to innovation management research of customer collaboration by explaining how SMEs operationalize ambidexterity through practical arrangements rather than structural separation.

Keywords: SMEs; Ambidexterity; Dual Business Models, Customer Collaboration; Cross-Functional Teams; Innovation Management; Business Model Innovation; Commercialization; Boundary Mechanisms

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1.Introduction

Firms increasingly rely on customer collaboration to drive innovation, particularly in business-to-business (B2B) contexts where product and services must be tailored to complex, uncertain, and evolving user requirements. In many industrial settings, customers often possess context specific knowledge that firms cannot easily replicate internally. As a result, customer collaboration has become an important source of innovation, learning and opportunity recognition.

Open inbound innovation research emphasizes that these sources are widely distributed beyond firm boundaries and firms should actively leverage capabilities (Chesbrough, 2003). Similarly, user innovation research shows that customers and user are not merely passive recipients of value but active contributors in customer collaboration, co-creation, and user involvement as critical resources of innovation outcomes (Von Hippel, 2005)). More recent research suggests that customer collaboration strategies represent a key mechanism especially important SMEs to enhance innovation performance (Audretsch and Guenther, 2023), and be particularly valuable. Smaller firms often face limited R&D resources and financial constraints but may compensate through flexibility and closer customer relationships. Collaboration can therefore become a strategic mechanisms that help SME's identify opportunities, validate solutions quickly and compete with larger rivals (Audretsch and Guenther, 2023, Chesbrough, 2003).

Despite these benefits, firms face a fundamental challenge in balancing openness toward customers with internal efficiency, coherence, and value capture. While openness can enhance creativity and responsiveness, it may also undermine operational discipline (March, 1991). Customized solutions can consume managerial attention, strain production, and reduce scalability, if not properly governed. In other words, firms may succeed with innovation while struggling with commercialization. This tension is particularly salient in SMEs operating in industrial market. Such firms often depend on close customer collaboration to develop innovation and require standard processes exploiting these innovations in broader market contexts. This challenge therefore reconciles two competing logics of value creation.

On the one hand, a collaboration strategy with coherent business models relies on deep, knowledge-intensive relationships with a limited set of partners are particularly suited for exploration because that helps firms to discover unmet needs, generate novel solutions and build trust-based relationships. On the other hand, a market-based strategy with coherent business model designs involves broader participation but weaker relational ties emphasize scalability, standardized offerings, and transactional exchange. These models are suited for exploitation, because they support scale, repeatability and efficient value capture. Managing these competing logics simultaneously reflects the classic challenge of organizational ambidexterity; requires balancing exploration and exploitation (O'Reilly and Tushman, 2004, Raisch et al., 2009)

Prior studies have examined ambidexterity through structural separation, where differentiated units pursue exploration (Benner and Tushman, 2003,

Tushman and O'Reilly, 1996) or contextual integration, where individuals balance competing demands (March, 1991, Gibson and Birkinshaw, 2004, Raisch et al., 2009, O'Reilly and Tushman, 2013). However, both approaches remain insufficiently specified in explaining how these logics are dynamically coordinated in practice (Raisch et al., 2009).

Business model research offers a complementary perspective conceptualizing value creation through the design of two dual drivers of novelty and efficiency (Zott and Amit, 2007, Zott and Amit, 2008), proposed as an ambidexterity perspective. However, less is known about how SMEs combine multiple business models logics simultaneously and how these are translated into day-to-day organizational practice. Recent studies emphasize the importance of understanding SME-specific business model innovation processes, particularly how smaller firms reconfigure value creation logics under resource constraints and changing market conditions (Spieth et al., 2025, Rabetino et al., 2025), thus we need to understand how business model innovation support exploration (market driving), exploitation (market driven) or ambidexterity (Spieth et al., 2016),.

Dynamic capabilities research emphasizing firms ability to recombine knowledge across organizational boundaries (Kogut and Zander, 1993, Eisenhardt and Martin, 2017), emphasizes sensing, seizing and transforming in changing environment (Teece, 2007, Teece, 2018). Yet critics have noted that these concept often are abstract and underspecified regarding the concrete organizational mechanisms in which adaption occurs (Helfat, 2007). In this practice, managers need to know how firms convert customer interaction into internal innovation and commercial outcomes.

This paper addresses that gap by the following research question:
How do SMEs integrate the dynamics of collaboration-based and market-based business models within a customer collaboration strategy?

Drawing on a longitudinal qualitative study of a chemical industry SME, the paper identifies a cross-functional mechanisms that connect external customer interaction with internal co-creation of innovation, coordination, and scaling processes.

The paper argues that ambidexterity in SMEs may be achieved not only through separated structural units, but through practical arrangements that allow collaboration-based exploration and market-based exploitation to co-exist and reinforce each other over time.

Drawing on autopoietic system (Maturana and Varela, 1980, Maturana and Varela, 1987), the study conceptualizes firms' adaption as a self-producing organizational system that maintaining internal coherence. The firm interacting with the environment for renewal through the boundary elements functions as mechanisms for cross-functional teams enabling sensing through structural coupling with customers, seizing opportunities through collaborative business models for exploration, and transforming through market-based business models that enable exploitation.

Thus, the study addresses a key limitation in ambidexterity and dynamic capability research by identifying boundary elements, operationalized as cross-functional teams, as the dynamically coordinated mechanisms that link firm–environment interaction to internal processes of sensing, seizing, and transforming.

Furthermore, the study contributes to innovation management research by showing how customer collaboration can function as a sustained engine of innovation in SMEs rather than an ad hoc activity.

The study extends dual models and ambidexterity research by explaining how dual business model designs of collaboration-based and market-based can co-exist through practical organizational arrangement.

The remainder of the paper is structured as follows: Section 2 reviews the theoretical background. Section 3 outlines methodology. Section 4 presents the findings. Section 5 discusses implications. Section 6 concludes.

2. Theoretical Background

2.1 Ambidextrous Structures

Organizational ambidexterity refers to a firm's ability to balance exploration and exploitation simultaneously (March,1991; O'Reilly & Tushman, 2004). Exploration involves experimentation, search, innovation and development of new opportunities. Exploitation emphasizes efficiency, refinement, implementation, and use of existing capabilities.

Prior research has proposed two dominant solutions when enacted simultaneously. First, structural ambidexterity separates exploration and exploitation into differentiated organizational units with distinct processes, incentives and cultures (Tushman and O'Reilly, 1996, Benner and Tushman, 2003), allowing exploration to be protected from efficiency pressures. Second, contextual integration (Gibson and Birkinshaw, 2004) enables individuals and teams to share their attention between exploration and exploitation in shared settings through supportive culture and management.

However, both approaches view ambidexterity as static organizational design, and remain insufficiently specified in explaining how these logics are dynamically coordinated in practice (Raisch et al., 2009).

This study views ambidexterity as practical capability building on Markides and Charitou (2004) conceptualizing ambidexterity as a contingent alignment of structure, strategy, and context. In this study, it applies to how firms sustain dual business models that combine collaborative exploration with exploitation through commercialization.

2.2 Dual Business Models: Collaboration and Market Logic

Business model research conceptualizes value creation through the design of two dual drivers of novelty and efficiency (Zott and Amit, 2007, Zott and Amit, 2008), proposed as an ambidexterity perspective. These two logics resemble the exploration–exploitation distinction in ambidexterity research. Scholars have begun

to investigate how firms must redesign their business models for novelty and efficiency to integrate open innovation (Hienerth et al., 2011, Storbacka et al., 2012). Extending this perspective to customer collaboration, Foss and Saebi (2015)) study distinguishes between collaborative strategies that relies on deep, knowledge-intensive relationships with a limited set of partners and market- based strategies with broader participation but weaker relational ties.

Customer collaboration involves businesses and customers working together to create value, integrating customer input throughout the entire journey to deliver more relevant and higher-quality offerings (Prahalad and Ramaswamy, 2004, Payne et al., 2008). These are implemented though collaboration-based (collaborative innovation in Foss and Saebi (2015)) particularly suited for exploration because that helps firms to discover unmet needs, generate novel solutions and build trust-based relationships, and as market-based business models (efficiency-centric in Foss and Saebi (2015) as scalable, transactional and efficiency-driven suited for exploitation. This distinction provides a more grounded specifications of dual value creation logics. These business models can be analytically understood in an organizational perspective through three interdependent dimensions: content, structure, and governance of transactions (Foss and Saebi, 2015) supporting the firm's creation, delivery and capture of value (Santos and Spector, 2009, Zott and Amit, 2008, Zott and Amit, 2010).

Rather than viewing these models as mutually exclusive, this study propoeses that SMEs may benefit from combining both. Collaboration-based can generate exploration as innovation output, while market-based models commercializes these outcomes more broadly. This perspective extends prior business research showing that SME may use dual businesss models as an organizational solution to innovation and growth tensions.

2.3 Systemic Mechanisms

Dynamic capability refer to a firm's ability to integrate, build, and reconfigure internal and external competencies in changing environment (Teece et al., 1997), a theory later conceptualized to processes of sensing, seizing, and transforming opportunities (Teece, 2018, Teece, 2007). Sensing involves identifying opportunities and threats, seizing refers to mobilizing resources to capture opportunities, and transforming involves reconfiguring structures, routines and capabilities to sustain competitiveness. The concept of dynamic capabilities has been used to describe the ability of companies to respond and adapt to rapidly changing environments as opposed to more traditional static capabilities to perform existing tasks competently (Orelj and Torfason, 2022)), and may enable ambidexterity by helping firms sense opportunities, recombine knowledge, and reconfigure resources across explorative and exploitative activities (Kogut and Zander, 1993, Eisenhardt and Martin, 2000).

However, while these perspectives emphasize the importance of external interaction and adaptive processes, they remain only partially specified regarding how the organizational mechanisms through which such adaptation is internally

generated and sustained (Helfat et al., 2009, Winter, 2003) In particular, the mechanisms that mediate between firm–environment interaction and internal organizational processes remain insufficiently elaborated, thereby limited understanding of how dynamic capabilities are operationalized in practice.

To address this limitation, this study draws on autopoiesis as a systems-based theoretical framework (Maturana and Varela, 1980, Maturana and Varela, 1987, Mingers, 1995, Maula, 2006) where organizational adaptation is understood as a process of reproduction rather than externally driven reconfiguration. Autopoiesis conceptualizes organizations as self-referential systems that reproduce their structures through communication and decision-making, while remaining structurally coupled to their environment (Luhmann, 1995). A characteristic is that both autonomy for exploration and control of exploitation can be simultaneously enacted within an autopoietic system.

Within this framework, the boundary elements—such as cross-functional teams—may be understood as organizational mechanisms operating the firm-environment surface enabling renewal (Maula, 2000, Maula, 2006, Koskinen, 2010). These mechanisms can support sensing of customer needs by facilitating interaction across organizational and external boundaries. Collaboration-based business models may enable seizing of these opportunities through structural coupling emphasizing co-creation, experimentation, and problem-solving in close interaction with selected customers. Subsequently, knowledge generated through these interactions is transformed into market-based business models, where activities are standardized, coordinated, and scaled, for preserving internal coherence.

Building on the above perspectives, this study proposes that customer collaboration strategy combine a dual business model, with collaboration-based and market-based business models support innovation and efficiency respectively. Cross-functional teams, acting as the boundary elements, helps these logics by connecting external interaction with internal coordination. Repeated dynamic integration of collaboration-based and market-based models may enable SME ambidexterity when aligned with structure, strategy and context (Markides and Charitou, 2004).

3 Methodology

3.1 Research Settings

Following Eisenhardt (1989:537) guidance, the case firm was chosen because of the focal phenomenon of customer collaboration and business model innovation was “transparently observable.”

The SME operates in the chemical industry, where it develops new products through close customers collaboration despite competing with substantially larger major rivals, some estimated to be ten times its size. The firm primarily serves the B2B markets, making inbound open innovation through customer interaction,

which account for approximately two-thirds of total revenues, as a central feature of its broader competitive environment.

3.2 Research Design

This study adopts an abductive, qualitative research design based on a longitudinal single-case study (Yin, 2018). An abductive approach is suitable for exploring under-theorized phenomena and for iteratively linking empirical observations with existing theoretical frameworks (Timmermans and Tavory, 2012). A single-case design allows for in-depth analysis of organizational processes and interactions over time, which is essential for understanding dynamic phenomena such as ambidextrous business models and organizational renewal.

3.3 Data Collection Method

To enhance transparency, Figure 1 summarizes the longitudinal research process, data sources, and analytical logic used to identify how collaboration episodes triggered shifts in business model design over time.

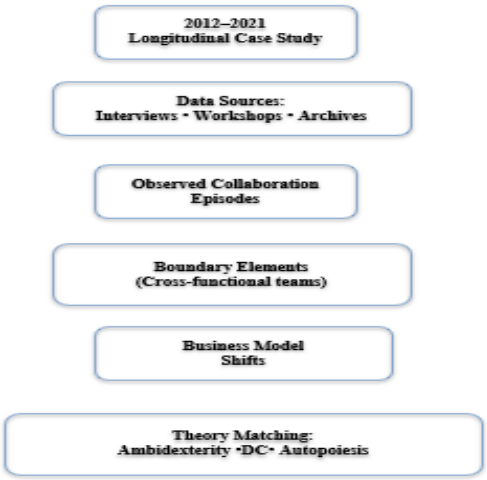

Figure 1. Longitudinal Research Process and Analytical Logic

The visual process model illustrates how multiple sources of evidence were iteratively combined to trace organizational responses, identify recurring mechanisms, and refine the theoretical explanation

Data were collected over a nine-year period (2012–2021) using multiple sources of evidence supporting active abductive insight over time (Timmermans and Tavory, 2012) to ensure triangulation and analytical robustness (Yin, 2018).

These sources included participant observation, prior peer-reviewed research articles, integrating semi-structured and open interviews with managers and employees across hierarchical levels, workshops focusing on innovation and business model development, and extensive archival material such as strategic plans, internal reports, and presentations.

Repeated engagement with the firm enabled the development of rich longitudinal insights into how customer collaboration practices and business

models evolved over time. This longitudinal and multi-source design enhanced the robustness of the findings by providing longitudinal depth and strengthened construct validity through data triangulation (Denzin and Lincoln, 2000, Yin, 2018, Stake, 1995)

3.4 Data Analysis Procedure

Data analysis followed abductive logic, iterating between empirical observations and theoretical concepts (Dubois and Gadde, 2002). Interview material, workshops, project documents, and archival sources were reviewed chronologically to identify recurring collaboration episodes, organizational responses, and business model shifts over time.

The material was then analyzed using concepts from cross-functional teams, business model innovation, before pattern matching was used to trace how customer collaboration triggered internal adaptation and changes in value creation logic (Yin, 2018).

Finally, these recurring mechanisms were subsequently to the theory of ambidexterity, aligned with dynamic capability, and interpreted cautiously through an autopoietic systems perspective. Boundary elements, operationalized as cross-functional teams and surface structures, were conceptualized as organizational mechanisms through which the firm translated external collaboration into internally coordinated innovation and market exploitation. This procedure strengthened analytical rigor through triangulation and iterative theory-based interpretation, enhancing analytical reliability (Yin, 2018).

4 Findings

4.1 Analytical Logic of Findings

Figure 1 illustrates the analytical logic of the findings, guided by the theoretical concepts of a holistic configuration (Whittington et al., 2020) used to explain the development of dynamic ambidexterity structure drawing on Markides and Charitou (2004) concepts of strategy, structure and context. The SME' customer strategy is operationalized through value designs, expressed as two complementary collaborative and market-based business models, supported by the structure relates with organizational arrangements and cross-functional teams, within the system context of environment, boundary element and autopoiesis. Following this framework, the empirical analysis begins with the presentation of the firm's organization.

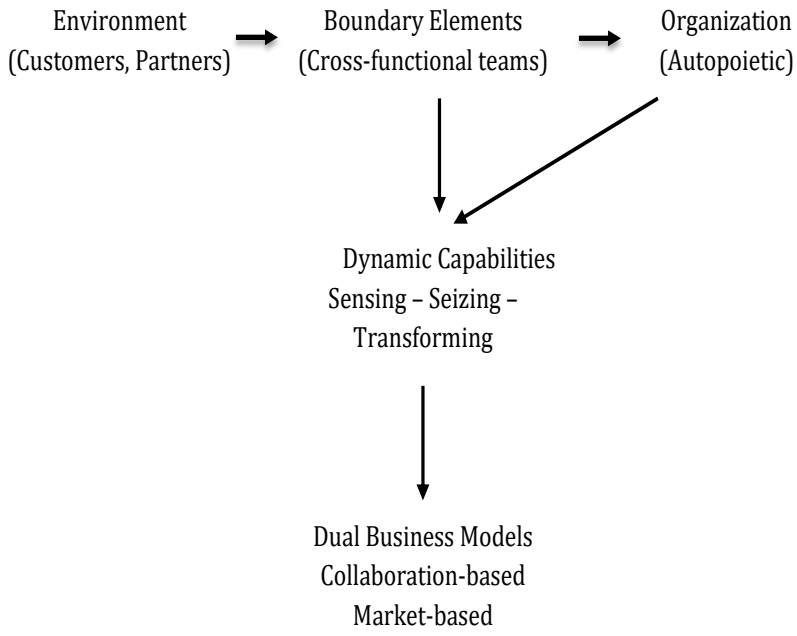

Figure 2. Analytical logic of findings

4. 2 The Firm

The case firm is an anonymized Scandinavian manufacturer of anionic surfactants serving customers across Europe and global B2B markets. The firm supplies specialty chemical inputs for household detergents, personal care, and industrial applications. Operating on a global scale, the case firm integrates advanced production technologies with a mature distribution system, reflecting a strong operating capability and a solid competitive positioning.

Publicly available accounting data indicates strong and stable performance. The firm reported revenues of approximately EUR 75 million in 2021, while average return on total assets (ROA) during 2017–2021 was around 12.7%, indicating above-average capital efficiency for a specialty chemical producer.

4.3 Structure Change and System Context

Findings reveal that in the mid-2000s the SME transitioned from product-centricity to customer coloration market orientation (Narver and Slater, 1990, Jaworski and Kohli, 1993, Day, 1994). This transformation involved replacing external sales agents with an in-house sales force, establishing a development department, and introducing automated production processes. To support these changes, the firm has created a cross-functional team with integrated capabilities across several functional departments. Rather than incremental adjustments, these moves structurally embedded collaboration into internal reorganization, moving the firm towards an inbound open innovation strategy (Foss and Saebi, 2015, Teece,

2010). Internal resources indicate that approximately 70% of innovation activity involved customers collaboration through open innovation.

To manage the complexity of customer collaboration, the cross-functional team was formalized as the Innovation Management Team (IMT), functioning as boundary element unit for firm-environment interaction (Tushman and Katz, 1980, Ancona and Caldwell, 1992, Edmondson, 2012). IMT consists of sales, marketing, R&D, and operational staff. It interfaces directly with customers and institutionalizes collaboration across ideation, design and use phases, thereby ensuring systematic integration of input into processes for co-creation and development processes while sustaining the user-producer relationship.

Interpreted in systemic view informed by autopoiesis, these findings suggest that IMT functions as an organizational unit that is both contained within, and reproduces, an identifiable boundary (Maula, 2006:71, Seidl, 2005). The boundary element connects the organization with its environment and facilitates interaction. Customer needs serve as triggers or signals sensed by IMT, which are developed through customer co-creation, interaction and formal contracts subsequently reintegrated into internal processes through IMT, as a boundary element, enabling and sustaining reciprocal interaction and communication.

As an organizational unit, IMT encompasses the roles and functions of the project manager and members within the firm (Maula, 2006, Maula, 2000, Koskinen, 2010), that connects the organization with its environment as surface enabling customer collaboration.

By integrating dynamic capabilities with autopoiesis, the findings show that IMT senses customer needs, with opportunities are seized through structural coupling within the collaborative business model and subsequently transformed internally through self-referential processes within the marked-based business model.

IMT therefore coordinates two coherent but differentiated value designs: a collaborative innovation business model for exploration and market-based business model for exploitation. Across both models, content, structure, and governance, represent key managerial levers that Foss and Saebi (2015) argue managers must recalibrate when engaging customer collaboration in open inbound innovation.

4.4 Collaborative Business Model

In a collaborative business model this organizational context aligns the value proposition (content), reconfigures interaction channels and cross-functional teams (structure), and requires trust-based agreements or incentive mechanisms (governance).

The content of SME's collaborative business model lies in co-creation with customers as key knowledge partners for mutual development of innovation, requiring the transfer and integration of tacit knowledge (Foss and Saebi, 2015).

Similar to the lead-user method (Von Hippel, 2005), the SME approach places B2B customers at the forefront of co-creation, generating advanced innovations that neither party could have achieved alone.

Co-creation shapes tailor-made solutions through trust-based information exchange within the organized market (Lundvall, 1985;1988) via user–producer interaction. These processes operate as relatively self-organized, autonomous, and decentralized arrangements.

For SME, innovation is pursued in organized rather than anonymous markets, to co-develop solutions for customers' complex, unstructured problems.

For the firm, the content dimension emerges from collaborative interaction processes, resulting in tailored solutions and differentiated value propositions (Hienerth et al., 2011), driven by customers' strategic interests.

The structure of the collaborative business model lies in user-producer interaction as a dyadic relationship within organized markets. As the firm explicitly states, this approach "as a means to comprehend intricate problems from the customer's perspective, fostering mutual benefit and strengthening the relationship" (Firm statement on collaboration, 2017).

Unlike anonymous market competition, characterized by trust, codes of behavior, and relational stability (Lundvall, 1985, Lundvall, 1988) in organized markets, enabling tacit information to flow more openly from customers to the SME. Crucially, innovations at the SME diffuse through continuous customer interaction, where usage insights to be exchanged, interpreted, and re-integrated. Only the collaborative parties are involved within the relatively systemic closed relational structure, yet this closure enables interactional openness analogous to interactively openness in an autopoietic system (Luhmann, 1995). Firms benefit from partnering beyond their organizational boundaries, enabling firms to absorb and co-develop knowledge in a coherent manner (Ordonez-Ponce et al., 2021, Zott and Amit, 2010)

Even if operational closure characterizes organized market, autopoiesis must be complemented by cognitive openness (Johannessen et al., 1997, Johannessen et al., 1999); that is, the ability to access and integrate knowledge from the environment and SME's wider organization. Within this view, structural coupling through customer collaboration preserves the relational structure selectively incorporate environmental signals and perturbations that sustain innovation (Baxter, 2013). Organized market provides a durable framework that sustains innovation-oriented coupling and enables user–producer learning possible over time (Lundvall, 1985, Lundvall, 1988).

Governance mechanisms are embedded in the user-producer relationship (Lundvall, 1985, Lundvall, 1988) emphasizing trust, transparency, and joint responsibility.

Governance mechanisms rely on the SME's demonstrated problem-solving abilities, and strict adherence to codes of conduct that build customer trust. This depends on customers being willing to share sensitive information, because governance frameworks ensure protection. External partners become crucial assets in innovation (Chesbrough, 2003, Von Hippel, 2005, Jeppesen and Molin, 2003) with customers act as co-developers within this structure.

Formal long-term contracts—typically around 10 years—reinforce mutual trust and help minimize risk and support sustained innovation collaboration. Collaborative customers may accept an agreed reservation price as exclusive buyer, however, outcomes are not limited to exploration alone, if the customers accept a market price when product is more broadly shared with existing customers. Thus, exploration within the collaborative business models may subsequently transition into exploitation within the market-based business model.

4.5 Market-based Business Models

Exploitative outcomes arise when innovative products are offered to existing customers, where value capture is to competitive market prices and repeat transactions.

This necessitates a market-based (efficiency-centric) strategy/ business model focused on exploitation. The market-based business model emphasizes standardized production, internal coordination and cost control, reducing uncertainty and coordination costs (Foss and Saebi, 2015).

Firms typically adopt such a strategy to benefit from market-ready innovations and external resources, reducing development time and time to market. While market-based strategies often involve acquiring existing technologies or startups, the SME modifies this logic through internal development combined with customer collaboration, thereby substituting for pure external sourcing.

The market-based design value proposition (content dimension) is achieved through internally developed innovation co-created through customer collaboration rather than external sourcing. Through customer collaboration, the SME reduces uncertainty and coordination costs, ensuring market relevance capturing value without reliance on external suppliers (Milgrom and Roberts, 1992, Williamson, 1975)

Internally developed technology may minimize sourcing costs, while investment embedded in customer collaboration through user-producer relationships (relation-specific investments are sunk costs) avoiding switching costs, thereby strengthening SME's value capture.

IMT integrates customer feedback and internal R&D activities, coordinating innovation through long-term customer relationships rather than external anonymous supplier contracts. Typically, market-based innovation requires supplier evaluation, but the SME already performs these functions internally through the collaborative business model. IMT members possess strong collaborative capabilities members resemble Procter & Gamble's "T-Men" integration experts, who bridge knowledge boundaries (Dodgson et al., 2006), jointly assessing technologies together with lead customers to align them with the SME's needs for exploitation with existing customers. These exchanges are structured through more transactional relationships and governed by short-term market prices.

In summary, the SME demonstrates a hybrid efficiency-centric business model. While retaining the efficiency logic of market-based strategies, this model

emphasizes internally generated knowledge through customer collaboration, with IMT as the central integrating mechanism. Compared to theoretical expectations, the SME's market-based business model preserves a stronger role for internal R&D while reducing reliance on external suppliers, thereby generating cost advantages and strategic flexibility for the firm.

4.6 The Dual Business Model

The SME applies to a dual business model consisting of collaboration-based business model (explorative), and a market-based business model (exploitative), thereby integrating exploration and exploitation through novelty and efficiency within the same organizational system. This gives rise to two complementary perspectives.

One perspective is the ambidextrous business model, dynamically integrating exploration and exploitation (Raisch et al., 2009), thereby aligning with continuously changing environment while transforming internally coordinated organizational processes within the same organizational setting.

The second perspective is financial. Through customer collaboration, the SME may obtain a reservation price, defined as the highest price a customer is willing to pay for a jointly developed product, thereby enabling superior margins. However, depending on the customer's choice, the co-created product may be shared with existing customers, in which case the SME accepts market price, and several customers gain access to the same product.

If the product is sold in sufficient volumes to offset the difference between the reservation and market price, the value capture may be equally beneficial for the SME. Thus, the ambidextrous business model may be equally beneficial whether the collaborative customer retains exclusivity or chooses broader commercialization provided volumes are equal or higher. The main exception arises when lower volumes do not compensate for the price difference. This pricing mechanism may foster open and thrust worthy customer relationships while remaining economically beneficial for the SME.

4.7 Brief Summary of Findings

The findings of the SME's customer collaboration strategy show that the firm has a dual business model: collaboration-based for exploration through mutual co-creation, structured as user-production interaction, and governed in organized markets for long-term relationships, and a market-based business model enables exploitation and additional performance. This integration reflects the dynamics of organizational ambidexterity requiring dynamic capabilities for continuous adaption enabling by a renewable and self-producing organizational system. Through the autopoietic boundary element, the SME's IMT (innovation management team) enables sensing of customer needs, which are seized through structural customer coupling in the collaborative business model, and subsequently transformed internally through the market-based business model.

5. Discussion

5.1 Interpretation of Findings

This study sets out to explain the research question: How do SMEs integrate the dynamics of collaboration-based and market-based business models within a customer collaboration strategy?

While prior research has emphasized the importance of balancing exploration and exploitation, less attention has been given to the organizational mechanisms through which such balance is enacted and sustained in practice. The pattern of findings suggests that firms do not achieve ambidexterity through managerial intent alone, but, as suggested by Markides and Charitou (2004), through the alignment of organizational elements – structure, system and strategy/context – that collectively accommodate dual value creation logics over time.

By viewing the organization as a configuration of tightly interconnected elements (Miller, 1996) that are mutually reinforced through circular processes that sustain one another, where structure and system support strategy (Whittington et al., 2019). The findings indicate an interdependence between the organizational structure and the SME's firm-environment interaction through IMT, supported by system perspective informed by autopoiesis and dynamic capabilities, for achieving the SME's customer collaboration strategy. More specifically, novelty is created by collaboration-based business models that generate exploratory mutual value through relatively autonomous, structured user-producer relationships in organized market governed as long-term contracts, while such knowledge is efficiently converted into scalable and controlled activities by market-based business models.

From a system perspective, both autonomy and control are potentially simultaneously enacted within an autopoietic system, and, together with the SMEs organizational structure support autonomous customer innovation for exploration, while the controlled exploitation of such innovation is enabled through a market-based strategy. These dual strategies/business models are integrated dynamically, resulting in an ambidextrous business model that may generate financial benefits, with superior returns through collaboration exploration creation and lower marginal cost through efficiency-oriented exploitation.

5.2 Dual Business Models and Ambidextrous Structures

The first contribution concerns research on organizational ambidexterity. Prior research has typically conceptualized ambidexterity as either structural separation, where exploration and exploitation are allocated to differentiated units, or contextual ambidexterity, where individuals or teams balance competing demands within shared settings (O'Reilly & Tushman, 2004; Gibson & Birkinshaw, 2004). While valuable, these perspectives often privilege design choices over processual dynamics (Raisch et al.2009).

The study advances the literature by demonstrating the dynamic integration of exploration and exploitation may be the dynamically integrated with the organizational mechanisms of the boundary elements. In the focal SME, the cross functional teams sensing customer needs enables opportunities to be explored

through the collaboration-based business model and subsequently exploited through the market-based business model. Strategic intent determines whether these value designs are pursued in a complementary way. In this case, customer choice between reservation-based collaborative offer or market price functions as a coordination mechanism through which such alignment is reproduced. This extends prior work by shifting attention from static forms of ambidexterity to ongoing organizational processes that are sustainable over time.

The findings also complement Markides and Charitou (2004) dual business model perspective. They argue that firms may compete through dual business models in alignment with structure, strategy and context. The present study supports this view but further specifies that such alignment is not one-time design choice, but an ongoing organizational accomplishment continuously maintained through internal coordination and adaptative processes.

The second contribution relates to business model innovation research. Prior studies distinguish between novelty- and efficiency-oriented business models and has even proposed as an "ambidexterity perspective" (Zott and Amit, 2007, Zott and Amit, 2008). While analytically useful, these distinctions can remain abstract with respect to how such models are enacted organizationally.

This study refines that perspective by distinguishing between collaborative and marked-based business models. Collaboration-based business models emphasize relational mutual co-creation and intensive interaction in dyadic relationships with selected customers for governed collaboration over time.

Market-based models emphasize exploitation through scalability, standardized offerings and transactional exchange. This distinction is particularly relevant in B2B markets and SME context, where innovation frequently originates in user-producer relationship within organized markets but may later be commercialized more broadly.

The contribution lies in demonstrating the dual business models are not simply different revenue architectures, but represent distinct organizational logics of content, structure and governance, requiring different capabilities and coordination processes.

5.3 Systems Perspective and Autopoiesis

The third contribution concerns dynamic capability theory. Prior work has emphasized sensing, seizing and transforming as central processes for adaption (Teece, 2007, Teece, 2018). Yet critics have noted that these concepts often remain abstract and underspecified operationally (Helfat et al., 2009, Winter, 2003).

The case helps address this gap by identifying boundary elements as mechanisms that link customer interaction with internal organizational action. Boundary elements – such as cross-functional teams – enable firm to sense customer needs, seize opportunities by coordinating resources for customer collaboration across functions, and transform exploratory outcomes into scalable offerings. In doing so, they provide a more fine-grained account of how dynamic capabilities are enacted in practice.

The findings therefore suggest that dynamic capabilities should not only be viewed as higher- order capacities but also be embedded in concrete arrangement that connects external signals to internal action. This helps to open the “black box” between environmental change and organizational adaption and renewal.

A further contribution lies in integrating an autopoietic systems perspective. Rather than treating organizations as passive recipients of external stimuli, as in conventional open system approaches, autopoiesis conceptualizes firms as self-referential systems that interpret environmental events through internal communication and decision-making while being interactive open to their environment. In this vein, autonomy and control are simultaneously enacted within an autopoietic system, thereby supporting autonomous customer innovation for exploration, while the controlled exploitation of such innovation is enabled through a market-based strategy.

From this viewpoint, ambidexterity is not simply a response to environmental demands but a process of organizational reproduction through the autopoietic boundary element, enabled by dynamic integration of exploration and exploitation through an ambidextrous business model.

5.4 Managerial Implications

The study also offers practical implications. Managers seeking to combine customer collaboration with efficient commercialization should avoid treating ambidexterity as a purely structural issue. Simply creating separate units may be insufficient relying on structural separation.

Instead, they should focus on aligning organizational structure with supporting systems to enable the sensing of opportunities, cross-functional coordination of collaboration, and transformation of externally generated opportunities into scalable offerings for commercialization.

In practice, exploration activities may be concentrated in customer-facing innovation units, while exploitative activities remain embedded in broader commercialization settings. Cross-functional teams are particularly important for facilitating collaborative learning that may be transformed into scalable markets offerings.

6. Conclusion

6.1 Concluding interpretation

Overall, the study of the SME’s customer collaboration strategy demonstrates that ambidextrous business models are best understood not merely as a structural arrangement, but as a configuration of structure, system and strategy through which firms dynamically integrate collaboration-based and market-based business models. By identifying boundary elements as the mechanisms linking firm–environment interaction to internal processes, the study offers a more operational

and processual explanation of how firms sustain innovation while maintaining efficiency.

6.2 Limitations and future research

Several limitations should be acknowledged. First, the findings are likely context-sensitive, especially within SMEs and B2B environments where customer interaction is particularly salient. Future research could examine whether similar mechanisms apply in consumer markets or larger multinational firms.

Second, while the study conceptualizes boundary elements as key mechanisms, additional research could investigate variation in their form and effectiveness across industries. Third, future studies may further explore how autopoietic processes interact with dynamic capabilities over time, particularly during periods of disruption or rapid technological change.

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