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Administrative Sciences

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Suggested Citation: da Silva, Agostinho Antunes; Cardoso, Antonio J. Marques (2025) : Harnessing technology to drive coopetition and value co-creation: A service-dominant perspective, Administrative Sciences, ISSN 2076-3387, MDPI, Basel, Vol. 15, Iss. 2, pp. 1-29, <https://doi.org/10.3390/admsci15020064>

This Version is available at:

<https://hdl.handle.net/10419/321208>

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Article

Harnessing Technology to Drive Coopetition and Value Co-Creation: A Service-Dominant Perspective

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Abstract: Coopetition, the strategic blend of competition and collaboration, has emerged as a critical strategy for firms navigating today's interconnected and resource-constrained global economy. While coopetition networks offer substantial benefits, such as fostering innovation, market expansion, and scalability, they are fraught with challenges like resource-sharing risks, trust deficits, and the inherent tension between collaboration and competition. Despite these hurdles, the transformative potential of technology in enabling and enhancing coopetition networks remains underexplored. This study addresses this gap by integrating Service-Dominant Logic (S-D Logic) and institutional work to propose a comprehensive framework for technology-driven coopetition networks. It identifies seven systemic building blocks—coopetition actors, resource integration, service exchange, institutions, nested ecosystems, operand technologies, and operant technologies—that facilitate sustainable value co-creation. These components enable firms to navigate dynamic market conditions by fostering trust, collaboration, and innovation. This research emphasizes technology's pivotal role as a transformative enabler and strategic driver, enabling real-time interaction, seamless resource integration, and institutional alignment. Institutional work is highlighted as essential for managing regulatory, normative, and cognitive dimensions to ensure the Adaptability and longevity of coopetition ecosystems. By providing actionable insights into the design and management of resilient, technology-driven coopetition networks, this study offers a roadmap for sustainable and equitable value distribution. It contributes to the evolving discourse on strategic business networks, empowering organizations to harness the power of coopetition in an increasingly complex global marketplace.

Keywords: coopetition networks; service-dominant logic; value co-creation; innovation; institutional work



Received: 29 December 2024

Revised: 6 February 2025

Accepted: 10 February 2025

Published: 14 February 2025

Citation: da Silva, A. A., & Cardoso, A. J. M. (2025). Harnessing Technology to Drive Coopetition and Value Co-Creation: A Service-Dominant Perspective. *Administrative Sciences*, 15(2), 64. <https://doi.org/10.3390/admsci15020064>

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1. Introduction

In today's globalized economy, firms operate in an increasingly complex landscape characterized by resource asymmetry, rapid market evolution, and intensified competition. As industries become more interconnected, businesses—micro- and medium-sized enterprises (SMEs)—seek strategies to enhance competitiveness, expand market reach, and scale operations. One of the most effective strategic responses to these challenges is coopetition, a paradoxical interplay between collaboration and competition that allows firms to leverage shared resources while maintaining their competitive edge (Meena et al., 2023; Rouyre et al., 2024). However, while coopetition presents significant advantages, it also introduces challenges such as resource-sharing risks, opportunistic behaviours, and

fragile trust structures, which, if not properly managed, can destabilize networks and hinder long-term value creation (Crick, 2019; Reeves et al., 2022).

Despite the growing recognition of coopetition's strategic value, research remains fragmented and inconclusive regarding how value is created, distributed, and sustained within these networks (Klimas et al., 2023). Many existing theoretical perspectives—ranging from Game Theory and the Resource-Based View (RBV) to Paradox Theory, Transaction Cost Theory, and Network Theory—offer valuable insights into the mechanisms of coopetition (Corbo et al., 2023). However, these frameworks often fail to capture modern coopetition ecosystems' dynamic, multi-actor, and technology-driven nature, leaving critical gaps in understanding how firms effectively co-create value while balancing competitive and collaborative forces (Xie et al., 2023). Addressing these gaps requires an integrative conceptual approach considering the institutional and technological enablers shaping coopetition networks.

Technology fundamentally transforms coopetition dynamics by enabling real-time interactions, optimizing resource integration, and reshaping competitive landscapes (da Silva & Cardoso, 2024). IoT platforms, AI-driven coordination, and data analytics are key enablers of value co-creation, yet the precise mechanisms through which technology sustains and enhances coopetition remain underexplored (R. Bouncken et al., 2024). This study seeks to address this gap by developing a conceptual framework that examines the interaction between technology and institutional work, proposing a structured model for sustainable value co-creation in coopetition networks.

To structure this analysis, this study adopts Service-Dominant (S-D) Logic as its theoretical foundation (Vargo & Lusch, 2004). Unlike traditional Goods-Dominant Logic (Joiner & Lusch, 2016), which views value creation as a static, transactional exchange, S-D Logic reconceptualizes value as a dynamic, co-created process shaped through service exchange, resource integration, and institutional interactions (Vargo et al., 2024). This perspective is potentially relevant to coopetition networks as it (1) shifts the focus to service-based value co-creation (Vargo & Lusch, 2017), (2) emphasizes ecosystems where actors co-create value by integrating both tangible and intangible resources to generate mutual benefits (Jaakkola & Vargo, 2021), and (3) aligns with technology's role in shaping modern service interactions, business networks, and digital transformation strategies (Vargo et al., 2024). Moreover, S-D Logic provides an institutional lens, allowing for an in-depth analysis of how governance structures, shared norms, and institutional work stabilize coopetition relationships (Vargo et al., 2023a). By incorporating S-D Logic and technological enablers, this study offers a holistic framework for understanding the interplay between actors, institutions, and technology in coopetition ecosystems.

This study develops a conceptual framework for technology-enabled coopetition networks, focusing on value co-creation by addressing three key research questions: (1) How can technology facilitate coopetition within networks? (2) What institutional and technological configurations optimize value co-creation? (3) How can coopetition networks ensure sustainable and equitable value distribution? This research advances the theoretical understanding of coopetition networks by answering these questions while providing a structured foundation for future empirical validation.

This research begins by exploring the interplay between cooperation and competition, examining how firms navigate this duality to drive innovation and strategic positioning. An analysis of value co-creation mechanisms follows this, tracing the shift from coproduction to co-creation and positioning S-D Logic as a key perspective for understanding coopetition ecosystems. Next, this study examines how institutional work and technological advancements shape the sustainability and governance of coopetition networks, identifying technology's role in service ecosystems and addressing gaps in existing theoretical approaches. It then develops the systemic and institutional foundations for

technology-enabled coopetition networks, integrating insights from S-D Logic and digital transformation. Finally, it summarizes theoretical contributions, acknowledges limitations, and outlines future empirical research to validate and refine the proposed framework.

This study provides a comprehensive foundation for understanding how firms can strategically leverage coopetition by integrating S-D Logic's institutional perspective with technology-enabled networks. The proposed framework serves as a guiding model for balancing competition and collaboration, enabling firms to harness technology and institutional structures to drive sustainable and scalable value co-creation, focusing on real-world applications for SMEs.

2. Literature Review

The concept of coopetition has evolved significantly since its early conceptualization by Ray Noorda, the founder of Novell, in the 1980s. Initially recognized as a practical business strategy, coopetition gained a theoretical foundation through the work of [Nalebuff and Brandenburger \(1997\)](#), who, drawing on Game Theory, highlighted its transformative potential in reshaping competitive dynamics ([Nalebuff & Brandenburger, 1997](#)). By balancing collaborative engagement with competitive intent, coopetition enables firms to foster innovation, share resources, and create mutual value, even among direct competitors ([Manzhynski & Biedenbach, 2023](#)).

At its core, coopetition leverages synergies that allow firms to pursue shared objectives while maintaining strategic independence ([Gnyawali & Song, 2016](#)). By blending competitive and cooperative interactions, firms can mitigate risks, optimize resources, and unlock opportunities that would be unattainable in purely competitive or cooperative relationships ([Bicen et al., 2021](#)). This duality has made coopetition a critical driver of competitive advantage and innovation, particularly in technology-driven and rapidly evolving business ecosystems ([Chen et al., 2023](#)).

Over time, coopetition research has expanded across various disciplines and industries, reflecting its relevance in technology, manufacturing, and SMEs ([Meena et al., 2023](#)). Scholars have explored its strategic benefits and inherent challenges, particularly in contexts where firms must navigate trust dynamics, resource dependencies, and institutional constraints ([Xie et al., 2023](#)).

2.1. Theoretical Foundations of Coopetition

Coopetition's unique ability to balance collaboration and competition makes it a powerful driver of innovation and competitive resilience, particularly in environments characterized by resource asymmetry, technological disruption, and global interconnectivity ([Rouyre et al., 2024](#)). By engaging in cooperative and competitive interactions, firms can mitigate market uncertainties, leverage shared resources, and foster strategic growth ([Garay-Rondero et al., 2020](#)). However, despite its acknowledged strategic benefits, the mechanisms underpinning value creation in coopetition remain inconsistently conceptualized across research ([Gernsheimer et al., 2021](#)).

These inconsistencies stem from contextual factors such as trust, resource complementarities, and network dynamics, which shape coopetition outcomes in unpredictable ways ([Meena et al., 2023](#)). While several theoretical frameworks have been applied to explain coopetition, they often offer fragmented perspectives, emphasizing specific aspects while overlooking the broader systemic foundations that enable sustained value creation across networks ([R. B. Bouncken et al., 2015](#)).

Various theoretical perspectives offer distinct insights into the benefits and complexities of coopetition. Game Theory views coopetition as a strategic interaction, where firms balance cooperation and competition to optimize collective and individual gains. However,

information asymmetry and trust deficits often challenge its real-world applicability, which can hinder effective decision-making (Xie et al., 2023).

The Resource-Based View frames coopetition as a resource access and co-development strategy, emphasizing how firms enhance innovation and market reach by leveraging shared and proprietary resources (Gernsheimer et al., 2021). Similarly, Paradox Theory highlights the dynamic tension between collaboration and competition, viewing coopetition as an ongoing process of navigating contradictions to create strategic synergies (Corbo et al., 2023).

From an economic perspective, Transaction Cost Theory (TCT) focuses on minimizing transaction costs and safeguarding competitive interests through effective governance mechanisms, ensuring that firms manage risk while maintaining cooperative relationships (Spiller, 2010; Xie et al., 2023). Lastly, Network Theory underscores the significance of strategic positioning within business networks, demonstrating how firms access critical resources, manage interdependencies, and enhance value creation through network structures (Burga & Rezania, 2017).

While these frameworks provide valuable insights, their scope and focus vary. Game Theory optimizes strategic interactions, RBV and Network Theory emphasize resource and network dynamics, Paradox Theory addresses coopetition's inherent tensions, and TCT focuses on transactional efficiency and competitive safeguarding (Meena et al., 2023). However, a crucial research gap remains—existing frameworks fail to fully capture the systemic mechanisms of value co-creation in technology-driven coopetition networks.

As firms increasingly leverage emerging technologies, there is a pressing need to explore how technological innovations interact with institutional structures to shape coopetition outcomes. Addressing this gap is essential for developing a systemic understanding of value co-creation, providing the conceptual foundations for sustainable and scalable coopetition networks in technology-driven environments.

2.2. Value Creation Mechanisms in Coopetition Networks (Research Gap 1)

Traditional frameworks often conceptualize value creation in coopetition networks as a linear and static process primarily grounded in internal resources, market positions, or discrete strategic interactions (R. Bouncken et al., 2024). These approaches implicitly assume that value is an inherent characteristic of goods or services, flowing unidirectionally from producer to consumer (Amit & Zott, 2001). However, this goods-centric perspective fails to capture modern coopetition's fluid, interconnected, and evolving nature, where the boundaries between competition and collaboration are increasingly blurred (Xie et al., 2023).

Existing value creation models struggle to explain the dynamic and adaptive processes that define coopetition networks. Three key limitations stand out: (1) Traditional theories focus on firm-specific resources but overlook the interdependencies and complementarities that drive value creation in coopetition settings (Meena et al., 2023). In reality, value emerges through integrating shared and distinct resources contributed by multiple actors. (2) Static models assume fixed roles and contributions, yet coopetition networks require continuous renegotiation of positions, resources, and strategies as market conditions evolve (Xie et al., 2023). This limitation is especially problematic in industries driven by rapid technological change, and (3) conventional frameworks treat value as a predetermined result rather than a dynamic, iterative process of co-creation, negotiation, and distribution within networks (R. Bouncken et al., 2024). This narrow view obscures value creation's emergent and evolving nature in complex coopetition ecosystems.

To address these limitations, a relational and dynamic perspective must consider the continuous interplay between competition and collaboration in coopetition networks

(Vargo et al., 2024). This perspective is built on three core principles: Value as co-created, coopetition networks as adaptive ecosystems, and technology as a facilitator of value co-creation. This perspective provides a more comprehensive understanding of coopetition networks by shifting the focus from value as a static outcome to value as a dynamic and co-created process.

2.3. *The Role of Technology in Coopetition Networks (Research Gap 2)*

Traditional theoretical frameworks often fail to account for the complexity and interconnectivity that define technology-driven coopetition networks (Corbo et al., 2023). Technology serves a dual role in these networks: (1) As an operant resource, technology is a dynamic agent that drives innovation, coordination, and value co-creation (Kaartemo et al., 2017). (2) An operand resource is an enabler, providing infrastructure, tools, and digital platforms that facilitate interactions (Greer et al., 2016).

This duality underscores technology's multifaceted role in shaping coopetition dynamics, influencing how firms compete, collaborate, and integrate resources within evolving business ecosystems.

Conventional coopetition theories often emphasize static and linear interaction models, overlooking how technology fosters real-time, adaptive exchanges (Klimas et al., 2023). These models fail to address the following factors: (1) the networked and dynamic nature of digital interactions, where technology enables firms to adjust their strategies and collaborations constantly; (2) the role of technology in sustaining long-term coopetition, ensuring trust, transparency, and efficiency through data-driven decision-making and automation; and (3) technology's function in creating interconnected value ecosystems, where multiple actors co-create, distribute, and evolve value (Meena et al., 2023).

By embracing this technology-integrated perspective, research can provide a more accurate and comprehensive understanding of how firms build, sustain, and optimize coopetition networks in the digital economy.

2.4. *Reframing Coopetition Through Service-Dominant Logic: A Shift Toward Value Co-Creation*

S-D Logic fundamentally redefines goods as facilitators of service delivery, shifting the focus from ownership and production to specialized competencies that create service experiences (Vargo & Lusch, 2010). This perspective places service exchange and value co-creation at the heart of economic activity, challenging static, transactional views of value creation (Greer et al., 2016).

Within this framework, value is not intrinsic to products but emerges relationally, co-created through interactions among multiple actors in a shared system of resource integration and service exchange (M. A. Akaka & Vargo, 2014). This shift underscores the importance of understanding how firms, customers, and other stakeholders dynamically collaborate to create value within coopetition networks (Vargo et al., 2020).

The transition from coproduction to co-creation, and ultimately to value co-creation in service ecosystems, highlights coopetition networks' adaptive and systemic nature (Lusch & Vargo, 2014). This framework is defined by two key characteristics: (1) Value as an iterative and dynamic process—value is continuously derived, assessed, and redefined through real-time interactions among network actors, reflecting the fluid nature of markets (Bettencourt et al., 2014). (2) Ecosystems as complex adaptive systems—coopetition networks function as complex adaptive systems, where economic and social structures evolve dynamically, shaped by the collective actions of participating actors (Elo et al., 2024). By embracing S-D Logic, firms engaged in coopetition can better understand how value emerges through collaboration and competition, using these dynamics to drive innovation, Adaptability, and long-term sustainability.

3. Methodology

This study employs an integrative conceptual approach (Vargo & Koskela-Huotari, 2020) to construct a theoretical framework for understanding value co-creation within technology-enabled coopetition networks (TECNs). Conceptual research is a key tool for advancing theoretical development by synthesizing and integrating existing knowledge rather than relying on empirical data (Jaakkola, 2020). Given the complex and dynamic nature of coopetition, this methodology enables systematic exploration of underlying value co-creation mechanisms that empirical studies may not yet fully capture (Clemens et al., 2025).

3.1. A Conceptual Approach

Empirical research is valuable for hypothesis testing but often requires a well-established theoretical foundation. Since the mechanisms of technology-driven coopetition remain underexplored, a conceptual approach serves as a necessary first step in developing a structured framework that future empirical research can validate (Jaakkola, 2020).

This study begins with a focal phenomenon that is observable but not adequately addressed in existing research: In today's globalized economy, firms operate in an increasingly complex landscape characterized by resource asymmetry, rapid market evolution, and intensified competition. A critical aspect of this landscape is the role of technology in facilitating and sustaining coopetition while ensuring sustainable value co-creation. While previous studies have examined coopetition through Game Theory, the Resource-Based View, and Transaction Cost Theory (Meena et al., 2023), they often neglect the value of co-creation mechanisms and the digital nature of modern coopetition ecosystems (Corbo et al., 2023). The rapid transformation of business ecosystems through technology and globalization necessitates a new theoretical lens integrating institutional and service-based perspectives to understand coopetition dynamics better (Xie et al., 2023).

To address this gap, this study synthesizes insights from S-D Logic, which shifts the focus from goods-based competition to service-based value co-creation. This perspective aligns with modern coopetition's interactive and technology-mediated nature (Vargo et al., 2024; Vargo & Lusch, 2004). S-D Logic provides a conceptual foundation for understanding how firms integrate resources and co-create value in dynamic and digitally enabled networks (Clemens et al., 2025).

Viewing coopetition through this theoretical lens, this study develops a novel conceptual model that (1) clarifies how technology facilitates coopetition, (2) identifies institutional and technological configurations that optimize value co-creation, and (3) explores sustainable and equitable value distribution in coopetition networks.

Through this integrative conceptual approach, this research advances theoretical understanding while providing practical insights for firms navigating coopetition in digital ecosystems. It lays the groundwork for future empirical validation, ensuring the proposed model can be tested and refined through real-world applications.

3.2. Research Approach

This study follows a systematic conceptual approach, progressing through four key phases to develop a theoretical framework for developing future TECNs. It begins by identifying critical gaps in the existing literature, particularly the limited understanding of value co-creation mechanisms within coopetition networks and the underexplored role of technology in sustaining these interactions. Addressing these gaps, this research integrates S-D Logic and digital transformation research perspectives, synthesizing these theoretical foundations to construct a service-centric view of coopetition. This integration informs the next phase, where this study develops a structured framework outlining the key constructs

and building blocks necessary for designing and optimizing TECNs. While the framework provides a strong theoretical foundation, it also serves as a basis for future empirical validation through case studies, surveys, or network analyses, ensuring its applicability in real-world settings.

3.3. Theoretical Choices and Transparency

A structured and systematic literature review was conducted to identify and integrate the most relevant frameworks for understanding value co-creation within technology-enabled coopetition networks (TECNs) to establish a solid theoretical foundation for this study. Given the complex, multi-actor nature of coopetition and the increasing role of digital transformation in shaping business interactions, it was crucial to adopt a comprehensive and interdisciplinary approach to selecting the appropriate theories.

This process unfolded in three key phases: identifying relevant theories, ensuring comprehensive coverage, and applying selection criteria to refine the theoretical model. The goal was to construct a framework that captures coopetition's strategic, institutional, and technological dimensions, ensuring that it aligns with the dynamic and digitally driven business landscape.

3.3.1. Identifying Relevant Theories

To construct a robust theoretical foundation, this study conducted an extensive literature review spanning multiple disciplines, including strategic management, organizational theory, institutional economics, and digital transformation research. The objective was to identify foundational theories that have historically shaped coopetition research and contemporary perspectives that reflect the evolving nature of digital ecosystems. By integrating insights from these diverse fields, this study aimed to develop a comprehensive framework that captures the complexities of value co-creation in TECNs.

The review revealed several established theories, each offering distinct insights into coopetition's strategic, institutional, and technological dimensions. Among these, Game Theory provided a foundation for understanding coopetition as a strategic interaction, where firms carefully balance collaboration and competition to maximize their individual and collective benefits. Meanwhile, the Resource-Based View emphasized resource access and co-development, highlighting how firms leverage shared and proprietary assets to achieve competitive advantage and foster innovation.

From a governance perspective, Transaction Cost Theory addresses the mechanisms firms use to minimize risks and manage cooperation costs, ensuring that competitive tensions do not undermine collaboration. Similarly, Network Theory explored interfirm relationships and strategic positioning, explaining how firms navigate dependencies, partnerships, and access to critical resources within coopetition ecosystems.

This study also examined Paradox Theory, which provided a lens for understanding the inherent contradictions of coopetition, where firms must simultaneously compete and collaborate while managing conflicting strategic objectives. In contrast, S-D Logic introduced a dynamic and interactive view of value creation, shifting the focus from static transactions to co-created value, where firms integrate resources, technology, and institutional structures to generate sustainable benefits.

Additionally, Institutional Theory played a key role in explaining the governance structures, trust mechanisms, and regulatory frameworks that stabilize coopetition networks (Elo et al., 2024). It emphasized the influence of formal rules, industry norms, and shared expectations in shaping long-term collaborative strategies. Finally, Technology Research provided crucial insights into the impact of digital transformation on coopetition

dynamics, examining how AI, blockchain, data analytics, and cloud computing enable firms to enhance efficiency, transparency, and strategic coordination in digital ecosystems.

While these theories contribute valuable perspectives, no single framework fully captures the multi-dimensional nature of technology-driven coopetition. Given the need for a holistic and integrated approach, this study proceeded with a refined selection process to identify the most relevant theoretical foundations. The final framework needed to account for institutional structures, strategic governance, and technological enablers, ensuring a comprehensive understanding of how value is co-created in TECNs.

3.3.2. Ensuring Comprehensive Coverage

To develop a well-founded theoretical framework, this study undertook a systematic and structured literature review to ensure that the selection of theoretical perspectives was comprehensive and methodologically sound. The process began with an extensive search across leading academic databases, including Web of Science, Scopus, and Google Scholar, to identify key works that explore coopetition, value co-creation, digital transformation, and service ecosystems. Given the interdisciplinary nature of this study, it was essential to include insights from strategic management, organizational theory, institutional economics, and digital transformation research to capture a holistic view of the mechanisms driving value co-creation in TECNs.

To maintain academic rigour, the search was restricted to peer-reviewed journal articles, books, and high-impact conference proceedings, ensuring that only established and high-quality research informed the theoretical foundation. Key search terms such as “coopetition theory”, “value co-creation in networks”, “digital transformation and competition”, and “service ecosystems” were used to identify relevant literature, ensuring that this study captured both well-established theories and emerging perspectives.

Beyond direct keyword searches, this study employed citation tracking and snowballing techniques to refine the literature selection further. By tracing highly cited and influential research, this study was able to incorporate both seminal works that shaped coopetition theory and contemporary studies addressing the role of technology in modern business ecosystems. This iterative approach allowed for progressive refinement of theoretical perspectives, ensuring that the frameworks included in this study were historically significant and highly relevant to contemporary digital coopetition dynamics.

3.3.3. Selection Criteria for Theoretical Frameworks

Following identifying a broad range of theoretical perspectives, a systematic selection process was undertaken to determine which frameworks would serve as the primary theoretical foundation for this study. The goal was to ensure that the chosen theories aligned with the core themes of technology-driven coopetition and value co-creation while addressing the institutional and governance structures that sustain collaborative business ecosystems. To achieve this, each theoretical framework was assessed based on five key criteria.

The first and most essential criterion was relevance to technology-enabled coopetition. Given this study's focus on digital transformation and its impact on business interactions, priority was given to theories that explicitly explore how emerging technologies influence coopetition networks. The selected frameworks needed to account for the role of digital platforms, AI, blockchain, and data-driven decision-making in shaping collaborative and competitive dynamics.

The second criterion was the theory's focus on value co-creation. Since this study investigates how firms collaboratively generate and distribute value, preference was given to frameworks that define value as co-created rather than as a static or transactional

outcome. Traditional perspectives often view value creation as firm-centric, whereas a service-oriented, interactive approach was necessary to capture modern coopetition's fluid, networked, and technology-mediated nature.

Another essential factor was the ability to address multi-actor dynamics. Coopetition does not occur in isolation; it is embedded in complex ecosystems where multiple stakeholders—ranging from firms and suppliers to regulatory bodies and consumers—interact continuously. Theories that provided insights into network-level interactions, evolving business relationships, and shared ecosystems were prioritized, as they offered a more nuanced and realistic depiction of coopetition in digital environments.

This study also sought theories that integrated institutional and governance mechanisms, recognizing that sustainable coopetition requires structured governance, regulatory frameworks, and trust mechanisms to manage competitive tensions effectively. Theories incorporating legal structures, industry norms, cognitive models, and trust-building processes were particularly valuable in understanding how firms maintain long-term coopetition without opportunistic behaviours destabilizing the network.

Finally, a critical evaluation of alternative theories was conducted. While Game Theory, Resource-Based View, and Transaction Cost Theory have traditionally been used to explain strategic decision-making, resource control, and cost minimization, they were found to be insufficient for capturing the full complexity of modern coopetition networks. These frameworks (Corbo et al., 2023), while helpful in understanding competitive positioning and risk management, do not fully explain the technology-driven, multi-actor, and evolving nature of contemporary coopetition ecosystems. Therefore, their exclusion was not due to irrelevance but rather a necessity for a more integrative, service-oriented, and institutionally grounded perspective.

By applying these carefully structured selection criteria, this study ensures that its theoretical foundation is methodologically rigorous, conceptually robust, and practically relevant. The resulting framework provides a holistic understanding of how technology, governance, and strategic interactions converge to enable sustainable value co-creation in TECNs, setting the stage for future empirical validation and real-world application.

3.3.4. Final Theoretical Choices and Justification

Following a rigorous selection process, this study identifies three key theoretical perspectives as the foundation for understanding value co-creation in TECNs: S-D Logic, Institutional Theory, and Technology Research. These frameworks were chosen for their ability to capture the interplay between competition, collaboration, governance, and digital transformation in coopetition ecosystems.

S-D Logic provides a service-based perspective, emphasizing that value is co-created through interactions and resource integration rather than being a static outcome of firm-centric transactions. This aligns with technology-enabled coopetition, where firms leverage digital platforms to collaborate, innovate, and share resources in real time.

Institutional Theory highlights the governance structures, trust mechanisms, and regulatory frameworks that stabilize coopetition. It explains how formal contracts, industry norms, and cognitive models shape long-term collaborative relationships, ensuring stability in digital business ecosystems.

Technology Research focuses on the role of digital transformation as an enabler of coopetition. Emerging technologies like AI, blockchain, and data analytics enhance coordination, transparency, and efficiency, allowing firms to balance competitive and cooperative interactions more effectively.

These three perspectives complement one another, forming a comprehensive and integrative framework: S-D Logic explains how firms co-create value, Institutional Theory

provides a governance lens, and Technology Research highlights the role of digital enablers. By explicitly detailing the selection and justification process, this study ensures transparency and methodological rigour, offering a structured foundation for future empirical research and practical applications in digital coopetition ecosystems.

3.4. Research Strategy and Theoretical Coherence

To ensure conceptual rigour and coherence, this study follows a structured synthesis approach that unfolds in three interrelated phases. It begins by embedding value co-creation within coopetition networks, examining the role of institutions and S-D Logic in shaping collaborative dynamics. This phase establishes the foundational link between coopetition and service exchange, positioning institutions as key enablers of sustainable value co-creation.

Next, this study systematically maps theoretical intersections, exploring the interplay between technology, institutional work, and service exchange. By aligning these elements within the S-D Logic framework, this research highlights how digital transformation and governance structures shape the evolution of coopetition networks.

Building on these insights, the final phase develops a coherent theoretical framework, structuring the key constructs that explain how institutions and technology interact to sustain coopetition and foster long-term value co-creation. This study refines its conceptual model through this iterative process, ensuring logical consistency and alignment with existing research. By systematically mapping the relationships between coopetition, technology, and institutional work, this study constructs a robust framework that serves as both a theoretical lens and a practical guide for understanding how technology-driven coopetition networks function and evolve.

This study establishes a structured and theoretically grounded framework for understanding TECNs by adopting an integrative conceptual approach. This framework is a foundation for future empirical research, offering valuable insights into the interplay between technology, institutional work, and value co-creation in dynamic business ecosystems. As firms continue to navigate the complexities of digital transformation, future studies should build on this model through empirical validation, ensuring its applicability and effectiveness in real-world coopetition networks.

4. Institutional and Technological Foundations of Value Co-Creation in Coopetition Networks

The concept of service as a foundation of economic exchange has long been recognized, but the introduction of S-D Logic by [Vargo and Lusch \(2004\)](#) marked a paradigm shift in contemporary economic thought ([Vargo & Lusch, 2004](#)). Unlike traditional goods-centric frameworks, S-D Logic prioritizes operand resources—intangible assets such as knowledge, skills, and relationships—over operand resources, the tangible goods traditionally regarded as primary value drivers ([Vargo & Lusch, 2008](#)). In this perspective, goods are merely facilitators of service delivery, and value emerges through applying specialized competencies in dynamic exchanges ([Lusch et al., 2010](#)).

By redefining value as a dynamic and relational process, S-D Logic offers a conceptual foundation well suited for coopetition networks, where firms compete and collaborate. This framework challenges static perspectives of value creation, emphasizing that value is co-created through interactions within a shared institutional structure ([Greer et al., 2016](#)). Given coopetition's interconnected and evolving nature, institutional mechanisms are crucial in stabilizing relationships, facilitating trust, and governing value co-creation processes within these networks.

4.1. From Labour Theory to Value Co-Creation

Traditional economic theories, such as those of Adam Smith (1776, cited in (Parayitam & Guru-Gharana, 2010)) and David Ricardo (1817, cited in (Dome, 2003)), conceptualized value through the labour theory of value, emphasizing tangible production efforts as the foundation of economic exchange. Over time, however, economic thought has evolved to recognize value co-creation as a collective and interactive process involving multiple stakeholders—including suppliers, partners, allies, and customers (Normann & Ramirez, 1993). This shift from coproduction to co-creation and, ultimately, to value co-creation within service ecosystems reflects the growing complexity and dynamism of modern economic interactions (Vargo & Lusch, 2014).

From an S-D Logic perspective, value creation is not a static transaction but an ongoing, interactive process within service ecosystems, which are complex adaptive systems composed of interdependent actors and resources (Elo et al., 2024). These ecosystems function through value propositions, shifting the focus from fixed value delivery to value-in-use, where value is realized by applying resources within specific contexts (Sitaloppi & Vargo, 2017). This perspective underscores value creation's relational and dynamic nature, emphasizing that firms must engage in continuous resource integration and institutional alignment to sustain coopetition networks.

4.2. Relevance to Coopetition Networks

The S-D Logic framework provides a compelling lens for understanding value co-creation in coopetition networks. It emphasizes dynamic resource integration and continuous interaction among service ecosystem actors (Wieland et al., 2017). This perspective aligns with coopetition's fluid and evolving nature, where businesses must balance competition and collaboration to sustain long-term value creation (R. Bouncken et al., 2024).

By embedding S-D Logic within coopetition research, this study establishes connections with key strategic theories that further explain how firms leverage and reconfigure resources: the Resource-Based View highlights the importance of both shared and firm-specific resources in sustaining competitive advantage (Peteraf, 1993), the Competency Core Theory underscores the development and integration of unique capabilities for long-term success (Corbo et al., 2023), and the Corporate Core Competencies Theory focuses on how firms strategically recombine competencies to drive innovation and differentiation (Meena et al., 2023).

Through this integration, the study of coopetition shifts the focus from transactional and static competitive advantages to a more interactive and adaptive understanding of value co-creation. This perspective is particularly relevant in networks, where firms must continuously adapt to market shifts, competitive pressures, and emerging collaborative opportunities (Rouyre et al., 2024). By framing coopetition as an ongoing process shaped by institutional and technological environments, S-D Logic offers a more holistic view of how firms navigate the complexities of digital transformation and ecosystem-driven competition to sustain value co-creation.

4.3. The Role of Technology in Networks: Knowledge, Institutions, and Value Creation

Technology is more than just physical tools and devices—it encompasses a system of practices, processes, and knowledge recombination aimed at serving human purposes (Arthur, 2009). This broader perspective recognizes technology as tangible tools and the methods and processes that drive technological advancement.

Scholars such as Hughes (1989, cited in (Fullerton et al., 2014)) and Mokyr (2004) conceptualize technology as both an organizational framework for problem-solving and a repository of practical knowledge (Akwei et al., 2010). This perspective links technology to

broadier constructs such as knowledge, competencies, and capabilities, emphasizing that technological progress arises from the interconnected integration of resources to address challenges (Hunt, 2000).

Understanding technology as a dynamic system of knowledge and institutional processes (Elo et al., 2024) clarifies its role in value co-creation within coopetition networks (M. Akaka et al., 2023). Technology facilitates interactions and knowledge exchange and shapes the institutional structures that govern coopetition ecosystems, influencing how firms leverage, share, and protect resources in competitive environments (Vargo et al., 2023b).

4.4. Social Construction of Technology and Value Perception

The social construction of the technology framework emphasizes that technology's development, adoption, and perceived value are shaped by social groups and institutional contexts rather than being inherently determined by its functionality (Klein & Kleinman, 2002). Hunt (2000) reinforces this idea, arguing that technology's meaning and utility emerge through interaction with societal norms and shared practices (Hargadon & Douglas, 2001). This perspective challenges technological determinism, which assumes that technologies inherently possess value, instead highlighting the role of institutional arrangements in shaping how technologies are understood and integrated into business ecosystems (Munir & Phillips, 2005).

Building on this, M. Akaka et al. (2013) apply this framework to service ecosystems, illustrating how technology shapes and is shaped by institutional structures that govern its use (M. Akaka et al., 2013). The concept of interpretive flexibility further underscores this perspective, suggesting that different actors assign diverse meanings to the same technology based on their institutional and strategic contexts (Pinch & Bijker, 1984). These varying interpretations influence how technology is evaluated, integrated, and utilized within coopetition networks, reinforcing technological value construction's fluid and evolving nature.

4.5. Technology as a Key Enabler in Coopetition Networks

Technology does not generate value in isolation; instead, it is socially and institutionally constructed (Hunt, 2000), emerging through its integration with other resources and the broader coopetition ecosystem (Chesbrough & Rosenbloom, 2002). Institutional mechanisms are fundamental in shaping how technology is perceived, adopted, and evolves within coopetition networks, influencing its trajectory across three key stages (Vargo & Lusch, 2016).

In the designing phase of the networks, institutional norms, regulatory frameworks, and industry practices define how new technologies are framed and integrated, shaping their perceived utility and strategic application (Vargo et al., 2023a). As technologies gain traction, they move into the stabilization phase, where dominant interpretations and standardized applications emerge through repeated network interactions and institutional alignment. Over time, however, technology is not static; in the evolution phase, it adapts and transforms as new knowledge, resources, and institutional structures reshape its role, allowing firms to respond to shifting market dynamics and competitive pressures (Vargo et al., 2024).

This perspective underscores technology's iterative and co-evolutionary nature, where its role within coopetition networks is continuously redefined through social, institutional, and technological interactions (Moore, 1993). Rather than being a fixed or deterministic force, technology is shaped by evolving institutional ecosystems, adapting to coopetition networks' changing needs and structures.

Beyond its structural role, technology is instrumental in balancing collaboration and competition within coopetition networks. Traditional perspectives on value creation often assume a linear and static process, focusing on internal resources and transactional exchanges (R. Bouncken et al., 2024). However, modern coopetition networks are far more dynamic, involving continuous interactions among multiple actors who integrate distinct and shared resources in an evolving landscape (Xie et al., 2023).

Technology bridges this complexity by functioning in two interconnected roles: (1) As an operant resource, technology actively shapes network interactions and value co-creation processes through its intangible capabilities, such as artificial intelligence, data analytics, and digital innovation (Vargo & Lusch, 2017). These tools enhance firms' ability to analyze market trends, optimize resource allocation, and facilitate adaptive strategies in coopetition. (2) As an operand resource, technology provides the tangible infrastructure for coopetition, including digital platforms, cloud systems, and communication tools (Greer et al., 2016). These elements create the foundation for real-time collaboration, knowledge-sharing, and competitive differentiation within digital ecosystems.

By integrating these dual roles, technology reshapes value creation mechanisms, fostering interconnectedness, Adaptability, and resilience in coopetition networks. It facilitates resource integration, supports collaborative innovation, and enhances real-time decision-making, transforming coopetition networks into dynamic, self-adjusting ecosystems capable of responding to complex and rapidly changing market environments.

4.6. The Role of Institutional Work in Value Networks

The concept of institutional work, originating in organization studies, examines how individuals and organizations actively shape institutions through creation, maintenance, and disruption (Lawrence & Suddaby, 2006). This perspective offers a critical framework for understanding how actors influence institutional structures to foster value co-creation within ecosystems (Lawrence et al., 2009).

Institutions operate within three key pillars that structure ecosystems: (1) the Cognitive Pillar—represents shared understandings and belief systems that guide decision-making (Kleinaltenkamp et al., 2018); (2) the Normative Pillar encompasses social norms and values that shape expected behaviours (Vargo & Lusch, 2016); and (3) the Regulative Pillar consists of formal legal obligations and governance structures that establish rules and compliance mechanisms (Scott, 2014).

These institutional structures and processes provide the foundation for collective action and coordination, enabling actors to navigate complex ecosystems while facilitating stability and Adaptability in value co-creation networks (Sajtos et al., 2018). By engaging in institutional work, firms can reshape coopetition networks, ensuring that institutional arrangements align with evolving technological, competitive, and collaborative dynamics.

4.7. Ensuring Sustainability and Effectiveness in Real-World Coopetition Networks

The “paradox of embedded agency” is a key challenge in institutional work. While institutions shape actors' behaviours and decisions (Lawrence & Suddaby, 2006), those same actors actively work to modify, reinforce, or disrupt the institutional frameworks governing their actions (Greenwood & Meyer, 2008). This recursive dynamic underscores how coopetition ecosystems evolve through deliberate efforts to influence and adapt institutional structures to facilitate value co-creation (Vargo et al., 2020).

Institutional work manifests in three interconnected forms: (1) Creating Institutions—actors establish new frameworks, norms, and belief systems to support emerging practices and shared goals. Coopetition networks may involve developing collaborative governance structures or redefining resource-sharing norms (Vargo & Lusch, 2016). (2) Disrupting

Institutions—existing norms and systems are challenged to enable new approaches and innovations. This is often necessary to resolve conflicts, inefficiencies, or rigid institutional constraints (Hartmann et al., 2018). (3) Maintaining Institutions—actors engage in ongoing efforts to sustain stability and compliance, ensuring that institutional frameworks remain functional in response to organizational and environmental changes (Lawrence et al., 2009) (Lawrence et al., 2009). This involves subtle, iterative adaptations rather than overt transformations (Sitaloppi & Vargo, 2017).

These forms of institutional work do not occur sequentially but rather interact dynamically, with creation and disruption often leading to the maintenance and stabilization of other institutional elements.

Institutional work is critical for sustaining and reshaping coopetition networks to enable mutual value co-creation. However, this process is inherently complex, involving tensions, conflicts, and competing interests among multiple actors. Two key mechanisms emerge in this context: (1) Addressing Conflicts—overlapping institutional arrangements often generate tensions, requiring actors to negotiate, adapt, and align their practices to maintain ecosystem stability (Pedeliento et al., 2023) and (2) Fostering Adaptability—institutional work enhances the Adaptability of coopetition networks, allowing actors to respond dynamically to market shifts, technological advancements, and evolving collaborative relationships (Lawrence & Suddaby, 2006).

The institutionalization of value co-creation logic in coopetition networks occurs through continuous adjustments and negotiations as actors work toward establishing shared frameworks for balancing collaboration and competition (Chandler et al., 2019). This process is iterative, requiring ongoing refinements until a standardized model of institutionalized practices is widely accepted (Koskela-Huotari et al., 2020).

This perspective offers valuable insights into the mechanisms underpinning value co-creation in dynamic business ecosystems by examining how actors actively shape institutional arrangements (Lawrence et al., 2009). For cooperation networks, institutional work is both a conflict-resolution tool and a mechanism for building resilient, adaptable systems that sustain long-term value co-creation.

5. Advancing Coopetition Research: Bridging Value Co-Creation and Technological Integration Through S-D Logic

As highlighted in the literature review, despite extensive research on coopetition networks, two critical gaps remain: (1) the mechanisms through which value is co-created within these networks and (2) the role of technology in enabling and sustaining coopetition. Traditional theoretical frameworks often depict value creation as a static or linear process, failing to capture the dynamic, iterative, and multi-actor interactions that define contemporary coopetition ecosystems. Similarly, studies on technology's influence on coopetition tend to examine it in isolation, overlooking its interplay with institutional structures and service-based exchanges.

To address these gaps, this section explores (1) the evolution of value creation in coopetition networks, emphasizing resource integration, service exchange, and institutional alignment as key drivers of sustainable collaboration, and (2) technology's dual role as an enabler and structuring force in coopetition, shaping interactions, governance mechanisms, and the long-term sustainability of networks.

This section applies an S-D Logic perspective to offer a holistic and relational understanding of value co-creation in coopetition networks. It presents an integrated approach that links institutional work, technological advancements, and service ecosystems, contributing to a more comprehensive framework for sustainable coopetition strategies.

5.1. Addressing Value Creation Mechanisms in Coopetition Networks

S-D Logic conceptualizes value creation as a dynamic and interactive process (Jaakkola et al., 2024), emerging through reciprocal and iterative exchanges among network participants rather than being an intrinsic attribute of products or services (Vargo & Lusch, 2004). This perspective challenges traditional value paradigms, asserting that value is co-created through mutual engagement among firms, customers, and stakeholders (Vargo & Lusch, 2011).

This paradigm's core is operant resources—intangible assets such as knowledge, skills, and information (Lusch & Nambisan, 2015)—which are primary drivers of innovation, Adaptability, and collaboration in coopetition networks. These resources enable firms to generate unique forms of value that cannot be achieved in isolation, fostering new market opportunities and enhanced competitive positioning (M. Akaka et al., 2013). Moreover, S-D Logic asserts that competitive advantage in interconnected markets arises from possessing unique resources and the ability to dynamically integrate and recombine resources across organizational boundaries (Vargo, 2011). This Adaptability enables firms to navigate complex competitive and cooperative relationships, continuously aligning with shifting stakeholder needs (Chandler et al., 2019).

This evolving view of value creation emphasizes the need for coopetition networks to foster open dialogue, encourage shared learning, and support collaborative innovation (Vargo et al., 2024).

By adopting this resource-integration perspective, coopetition networks can redefine value creation, transforming their interactions into mechanisms for sustained innovation, strategic flexibility, and market leadership.

5.2. Addressing the Role of Technology in Coopetition Networks

S-D Logic provides a transformative perspective on how value is created and sustained within service ecosystems, positioning them as environments where value emerges through the collective interactions of all actors (Lusch & Vargo, 2014), coordinated by institutional and technological mechanisms (Barile et al., 2016). This perspective shifts away from traditional competitive models, reframing markets not as battlegrounds for competitive advantage but as collaborative spaces where competition and cooperation coexist within an intricate web of relationships (Uribe et al., 2020). Moreover, S-D Logic highlights service ecosystems' systemic and emergent nature, where value is not a fixed output but an ongoing process arising from interactions among network actors (Vargo et al., 2023b). Within these ecosystems, technology serves as both a facilitator and an amplifier of co-creative processes (Wieland et al., 2017).

From an S-D Logic perspective, coopetition within service ecosystems involves navigating the complex interplay of competition and collaboration to achieve (1) fostering innovation, (2) accessing new markets, and (3) enhancing customer experiences. As digital networks increasingly mediate economic and social interactions, technology's role in enabling, shaping, and scaling value co-creation becomes critical. Technology enhances coopetition networks by (1) enabling dynamic interactions and support to real-time, resource integration, and coordination among ecosystem participants; (2) joining problem-solving and innovation, providing shared infrastructures, capabilities, and data-driven decision-making insights; and (3) scaling value creation since technology allows coopetition networks to expand their operations and interactions, extending the reach of collaborative initiatives and enabling entry into new markets.

S-D Logic views technology as both a tool and a driver of ecosystem evolution, shaping how coopetition networks develop, function, and sustain themselves. Technology influences (1) institutional arrangements by redefining governance structures and resource

distribution models; (2) actor behaviours by enabling new forms of collaboration, trust-building, and strategic differentiation; and (3) resource integration by facilitating real-time knowledge exchange and seamless interoperability within networks.

As technology mediates increasing interactions, its impact on value co-creation and potential value co-destruction becomes more pronounced, requiring firms to manage their role within their ecosystems proactively.

Viewing coopetition through the lens of S-D Logic provides key insights for sustaining long-term network stability and value creation, including (1) institutional adaptability; (2) balancing collaboration and competition; (3) and network resilience.

Through this D-D Logic lens, coopetition is not just a firm-level strategy but a foundational principle shaping the evolution of service ecosystems. By understanding how technology fosters co-creative processes, firms can more effectively manage and sustain their coopetition networks, ensuring long-term value creation, Adaptability, and ecosystem stability.

6. Building Systemic and Institutional Foundations for Coopetition Technology-Driven Networks

Building on the theoretical foundations of S-D Logic, institutional work, and coopetition, this section directly engages with the research questions that shape this study. Examining these questions through an S-D Logic perspective establishes the foundation for the conceptual framework.

6.1. How Can Technology Facilitate Coopetition Within Networks?

From an S-D Logic perspective, technology and institutional work in coopetition networks are central in aligning diverse actors, including individuals and organizations, to enable sustainable and equitable value co-creation (Elo et al., 2024). This alignment is facilitated by creating, disrupting, and maintaining institutional frameworks (Beunen & Patterson, 2019; Vargo & Lusch, 2016), establishing the rules, norms, and shared understandings governing ecosystem interactions.

Under this view, coopetition networks rely on three key institutional elements: (1) Regulatory Elements—laws, industry regulations, and contractual agreements define acceptable behaviours, ensuring structured governance (Friend et al., 2020). At the meso-level, joint agreements and operational rules help establish trust and consistency (M. Akaka et al., 2013); (2) Normative Elements—shared values, ethical codes, and cultural norms foster a collaborative yet competitive environment, extending beyond formal agreements to promote transparency and cooperation (Foschi, 1972); and (3) Cognitive Elements—shared goals, narratives, and strategic frameworks align actors by minimizing conflict and fostering mutual understanding (Hartmann et al., 2018). Moreover, technology is a critical enabler that reinforces these institutional dimensions through enhanced communication, real-time data sharing, and digital coordination tools (Vargo et al., 2024). Technology as an Enabler of Institutional Alignment: Technology facilitates coopetition networks by (1) enhancing collaboration, (2) ensuring Adaptability, and improving transparency and governance.

However, effective coopetition networks require periodic disruption of institutional structures to realign them with evolving market dynamics and collective ecosystem goals (Edvardsson et al., 2014). This incremental and iterative process allows flexibility without destabilizing the network (Lawrence & Suddaby, 2006).

Figure 1 illustrates the interaction between institutional elements, technology, and actor interactions within a coopetition network. It highlights how technological enablers integrate with regulative, normative, and cognitive structures to sustain value co-creation while balancing competition and collaboration.

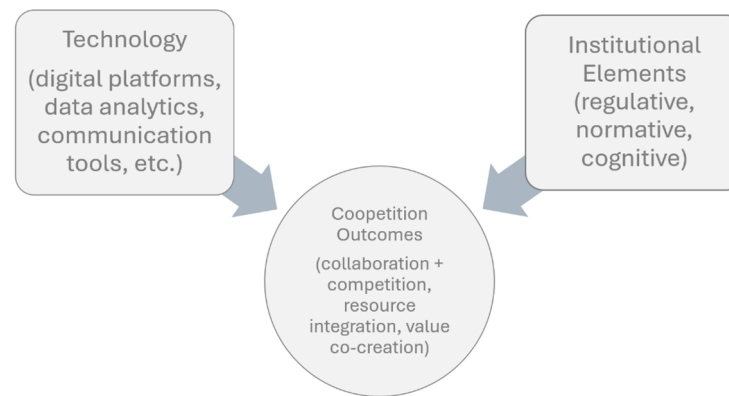


Figure 1. Key elements and technologies as enablers for value co-creation in coopetition networks.

In conclusion, creating and maintaining effective coopetition networks require institutional stability and technological Adaptability. By addressing regulative, normative, and cognitive dimensions, actors can co-create a balanced and resilient ecosystem where competition and collaboration coexist. Technology complements this process by providing the necessary platforms, data-driven insights, and communication tools that enhance collective value creation and ecosystem sustainability.

6.2. What Institutional and Technological Configurations Optimize Value Co-Creation in Coopetition Networks?

S-D Logic conceptualizes value creation as a dynamic, interactive process that emerges through reciprocal exchanges within service ecosystems (Jaakkola et al., 2024). Unlike traditional goods-centric approaches, S-D Logic highlights operant resources—knowledge, skills, and expertise—as the primary drivers of value co-creation (Lusch & Nambisan, 2015). Coopetition networks, by integrating resources and pooling competencies, unlock new opportunities for innovation, Adaptability, and growth that individual firms would struggle to achieve alone (Rouyre et al., 2024). The dynamic recombination of resources fosters shared learning and continuous innovation (Chandler et al., 2019), allowing firms to respond to market demands and maintain competitive differentiation simultaneously (Meena et al., 2023).

Within these networks, S-D Logic reframes value creation as a process shaped by institutional structures and technological enablers (Vargo et al., 2023a). Institutions provide the rules, norms, and cognitive frameworks that guide interactions. At the same time, technology serves as both a facilitator and an initiator of value co-creation: (1) as an operant resource, technology drives innovation and decision-making through artificial intelligence, data analytics, and machine learning, enhancing Adaptability (M. A. Akaka & Vargo, 2014); (2) as an operand resource, it provides the infrastructure for seamless collaboration, including cloud computing, blockchain, and IoT, enabling firms to efficiently coordinate, communicate, and integrate resources (Greer et al., 2016).

By fulfilling these roles, the technology scales resource integration, optimizes interactions, and ensures that coopetition networks remain agile and responsive to market shifts.

To maximize value co-creation, coopetition networks must align institutional and technological elements in the following ways: (1) Regulative Structures—clear legal frameworks, standardization policies, and contractual agreements that establish trust and mitigate risks in competitive relationships; (2) Normative Structures—shared industry standards and best practices that encourage collaboration while preserving competitive incentives; and (3) Cognitive Structures—a shared understanding of value co-creation principles, fostering a culture of mutual learning and innovation.

Figure 2 illustrates the key institutional and technological drivers that optimize value co-creation in coopetition networks. It highlights (1) the interplay between institutional structures and service ecosystems, showing how regulative, normative, and cognitive frameworks shape cooperative interactions among firms; (2) the dual role of technology as an operant resource (driving innovation through AI, analytics, and automation) and an operand resource (providing digital infrastructure such as IoT, blockchain, and cloud platforms to enable collaboration); and (3) the continuous feedback loop between institutional governance and technological advancements, demonstrating how aligned configurations reinforce Adaptability, innovation, and sustainable value co-creation.

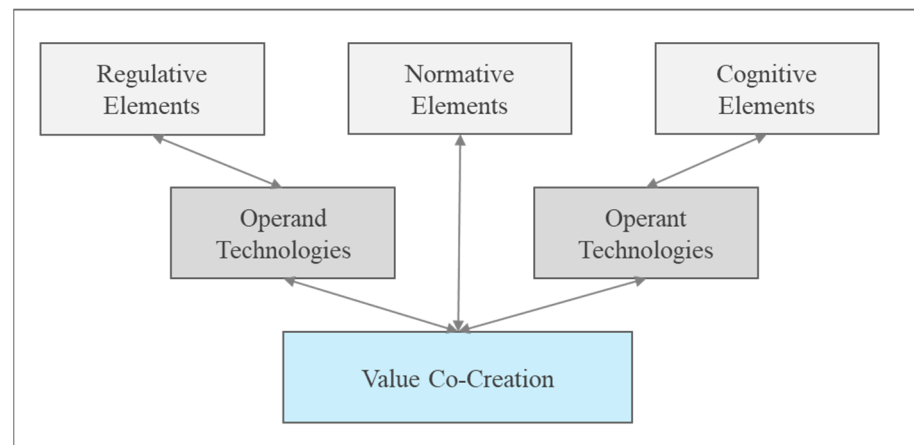


Figure 2. Institutional and technological drivers of value co-creation in coopetition networks.

By effectively integrating these institutional and technological configurations, coopetition networks balance competition and collaboration, fostering continuous innovation, operational efficiency, and long-term market resilience.

6.3. Responding to the Question: How Can Coopetition Networks Be Designed to Ensure Sustainable and Equitable Value Distribution?

The sustainability and equitable value distribution within coopetition networks hinge on their ability to adapt and evolve continuously. As market demands and environmental conditions shift, these ecosystems must engage in proactive governance, ensuring strategic alignment among diverse actors (Vargo et al., 2023b). Institutional maintenance becomes a pivotal mechanism for achieving this, encompassing the adaptation of regulative, normative, and cognitive elements to preserve alignment and cohesion within the network. Institutional maintenance mechanisms play a central role in fostering the longevity and equity of coopetition networks. These mechanisms include the following.

Regulative Elements: The rules, agreements, and standards that govern the network must remain flexible and responsive to changes in laws, market conditions, and industry norms. Regular adaptation ensures that institutional structures remain relevant and supportive of the network's objectives (Edvardsson et al., 2014). For example, revising collaborative agreements to reflect new regulatory landscapes or technological advancements can sustain trust and operational harmony among actors.

Normative Elements: Shared values, trust, and collaborative norms are essential for sustaining productive relationships within cooperation networks. Open dialogue, regular goal reassessment, and clear codes of conduct foster alignment and mutual understanding, mitigating conflicts and promoting cohesion (Koskela-Huotari et al., 2020). These practices ensure that competitive dynamics maintain the collaborative foundation of the ecosystem.

Cognitive Elements: Regular communication and shared narratives help actors align their perspectives and understand the network's evolving objectives. Narrative-building,

strategic storytelling, and sense-making practices ensure that participants remain united in their vision, even as external conditions change (Mustak & Plé, 2020). This cognitive alignment minimizes misunderstandings and enhances strategic coordination.

Coopetition networks are inherently dynamic, requiring continuous institutional maintenance and adaptation. Technologies such as blockchain for transparency, data analytics for monitoring value flows, and artificial intelligence for predictive insights can augment institutional mechanisms, ensuring equitable resource allocation and enhancing participant trust. Combined with institutional work that fosters alignment across regulative, normative, and cognitive dimensions, these technologies enable networks to balance collaboration and competition.

Figure 3 illustrates the key components and interactions required for ensuring sustainability and equitable value distribution in coopetition networks. It highlights the dynamic interplay of regulative, normative, and cognitive institutional maintenance mechanisms, supported by technology and strategic alignment, to foster Adaptability, trust, and shared understanding within a service ecosystem.

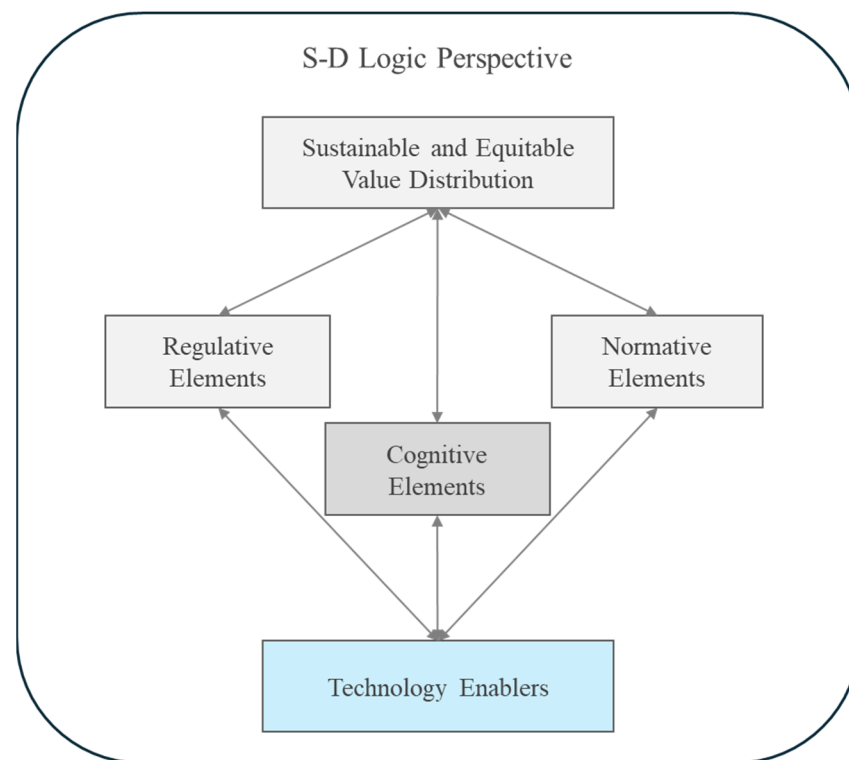


Figure 3. Sustainability mechanisms in coopetition networks, integrating institutional, and technological elements.

Adopting an S-D Logic perspective further enriches the understanding of sustainable and equitable value distribution in coopetition networks. S-D Logic emphasizes value creation's systemic and relational nature by viewing these ecosystems as service-oriented platforms where value emerges through iterative interactions and resource integration. This lens encourages stakeholders to prioritize the collective good, fostering an equitable distribution of benefits and ensuring the long-term viability of the ecosystem.

Through these integrative approaches, coopetition networks can become resilient ecosystems capable of addressing complex market challenges while ensuring equitable and sustainable value co-creation. This dynamic and adaptive framework equips networks to thrive in evolving market environments while balancing competition and collaboration.

7. A Strategic Framework for Technology-Enabled Coopetition Networks (TECNs)

Building on the service ecosystem perspective from S-D Logic (Vargo et al., 2015), this section introduces a structured and theoretically grounded framework for TECNs. The framework encapsulates the systemic interplay between institutional arrangements, technological enablers, and institutional work, offering a comprehensive model for fostering competition and collaboration within dynamic business ecosystems.

By integrating institutional structures with emerging technologies, this framework provides actionable insights into optimizing firm interactions, sustaining long-term partnerships, and driving continuous value co-creation. It delineates the key mechanisms that enable coopetition ecosystems to remain adaptive, resilient, and strategically aligned, leveraging technological advancements to enhance governance, resource integration, and network scalability.

This section elaborates on the framework's core constructs, illustrating how firms can design and implement technology-enabled cooperation networks that balance competitive tensions with cooperative synergies. By structuring interactions through technological infrastructure and institutional configurations, businesses can ensure sustainable and scalable value creation, effectively navigating the challenges of digital transformation and dynamic market conditions.

7.1. Core Constructs of the Framework

The proposed framework for coopetition networks is built upon three fundamental constructs: institutions and institutional arrangements, institutional technologies, and institutional work. These components shape interaction flows, governance structures, and the balance between collaboration and competition, ensuring the sustainability and Adaptability of coopetition networks.

7.1.1. Institutions and Institutional Arrangements

Institutions and institutional arrangements provide the foundation for coopetition networks, shaping behaviours, interactions, and collaborative efforts. These elements define the rules, norms, and shared understandings that regulate ecosystem operations, ensuring both cohesion and flexibility: (1) Regulative Elements—formal rules, contracts, agreements, and compliance mechanisms establish boundaries, ensuring consistency across the network; Normative Elements—shared values, ethical standards, and trust-based norms foster collaboration and guide behaviours toward collective goals; and (3) Cognitive Elements—a shared understanding of objectives and strategic alignment ensures coordination, minimizes conflicts and enhances adaptive decision-making.

By integrating these elements, coopetition networks achieve stability and strategic alignment while remaining adaptable to regulatory and market shifts.

7.1.2. Institutionalized Technologies

Technology plays a dual role in enabling coopetition networks, acting as both an operant and operand resource to drive innovation, interaction, and ecosystem scalability: (1) tangible innovation (operand) such as cloud computing, IoT, and blockchain, among others can provide the physical and digital infrastructure that supports resource integration and collaboration; and (2) intangible innovations (operant) such as AI, machine learning, and data analytics, among others, enhance strategic decision-making, enabling firms to identify new opportunities, optimize processes, and scale interactions.

These technologies enable seamless resource integration and service exchange by breaking down traditional barriers, allowing actors to co-create value in a digitally connected environment.

7.1.3. Institutional Work

Institutional work refers to the deliberate efforts by actors to create, maintain, and disrupt institutional frameworks, ensuring the network's long-term Adaptability and resilience. These efforts include (1) Creating New Institutions—establishing new rules, norms, and structures that align with the ecosystem's evolving needs; (2) Maintaining Existing Institutions—reinforcing and adapting current frameworks to sustain stability while remaining responsive to external shifts; (3) and Disrupting Institutions—challenging outdated structures and inefficiencies, enabling the network to realign with emerging opportunities and technological advancements.

This continuous cycle of institutional creation, maintenance, and disruption ensures that the coopetition network remains dynamic, fostering long-term innovation, collaboration, and competitive advantage.

Figure 4 illustrates the interplay between institutions, technologies, and institutional work in enabling coopetition networks. It highlights how new actors enter the network and interact with regulative, normative, and cognitive elements, shaping the institutional environment. Over time, actors engage in institutional work, either maintaining, disrupting, or creating new institutions, ensuring that the coopetition network remains adaptive, resilient, and strategically aligned.

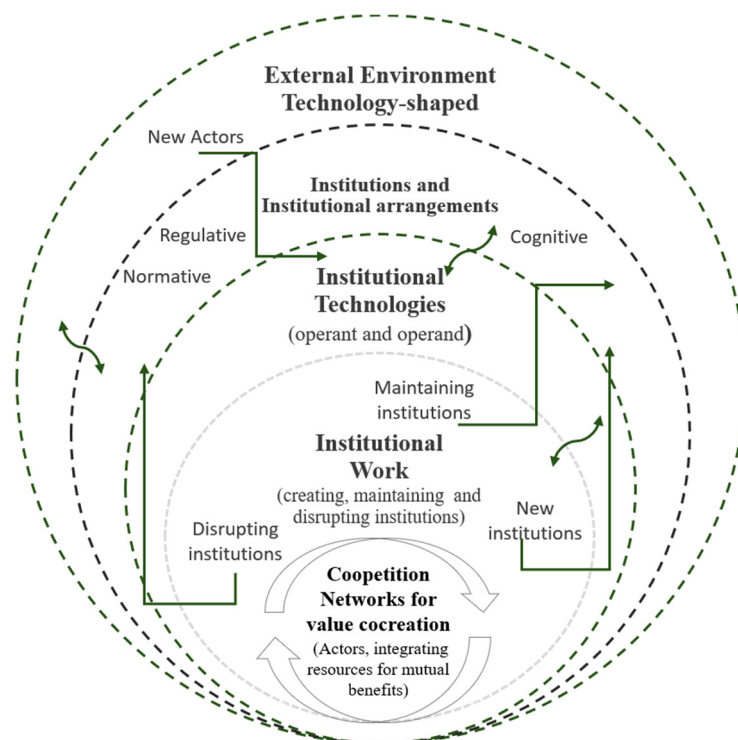


Figure 4. Key constructs of coopetition networks: institutions, technologies, and institutional work enabling collaboration, competition, and adaptability.

By integrating institutional arrangements, technological enablers, and institutional work, the framework provides a systematic approach to understanding how coopetition networks evolve, ensuring sustainable value co-creation and long-term competitive advantage.

7.2. Systemic Building Blocks for Technology-Driven Coopetition Networks

The framework identifies seven systemic building blocks that underpin technology-driven coopetition networks, ensuring sustainable value co-creation. These components interact dynamically, facilitating the balance between collaboration and competition while leveraging technology for innovation and network stability.

The key systemic building blocks are as follows:

1. **Coopetition Actors**—The core participants in the network, including firms, customers, and stakeholders, who navigate the inherent tensions between cooperation and competition. Their interactions drive innovation, market expansion, and collective value co-creation.
2. **Resource Integration**—The collaborative merging of diverse resources, capabilities, and competencies. This integration strengthens the network's collective value proposition, ensuring superior outcomes compared to individual contributions.
3. **Service Exchange**—The mechanism through which resources are shared and utilized. This process reinforces mutual benefits, demonstrating the interdependence of competitive and cooperative forces in value creation.
4. **Institutions and Institutional Arrangements**—Governance structures that provide rules, norms, and shared understandings. These frameworks guide interactions, ensuring stability while allowing for flexibility and innovation.
5. **Nested Service Ecosystems**—Coopetition networks operate within broader service ecosystems, interacting with external stakeholders, regulatory bodies, and industry standards. These nested layers reveal the complexity and richness of value co-creation processes.
6. **Operand Technologies**—Tangible digital tools such as IoT, blockchain, and cloud computing enable operational efficiency, facilitate coordination, and support seamless resource exchange.
7. **Operant Technologies**—Intangible, knowledge-based innovations like AI, machine learning, and predictive analytics catalyze decision-making, drive strategic realignments, and foster network scalability.

Figure 5 visualizes the interplay between these systemic building blocks, demonstrating how technological advancements (operant and operand technologies) integrate with institutional structures and coopetition actors to sustain adaptive and resilient ecosystems.

7.2.1. How the Building Blocks Enable Value Co-Creation

Coopetition networks can thrive in dynamic market environments by integrating these interdependent elements. The framework highlights three critical processes:

1. **Coordinating Resource Integration**—Ensuring pooled resources are strategically leveraged to maximize collective benefits.
2. **Enabling Seamless Service Exchange**—Facilitating efficient, reciprocal interactions among network actors.
3. **Fostering Dynamic Value Co-Creation**—Encouraging continuous innovation and Adaptability, maintaining the balance between competitive differentiation and cooperative synergies.



Figure 5. Building blocks for technology-driven coopetition networks.

7.2.2. Strategic Implications for Coopetition Networks

This systemic approach provides stakeholders with a structured foundation for managing the complexities of technology-driven coopetition. The key strategic takeaways are as follows:

1. **Leveraging Technology**—Harnessing digital tools and platforms to enhance collaboration, automation, and innovation.
2. **Aligning Institutional Structures**—Establishing shared governance mechanisms to balance competition and cooperation, ensuring long-term sustainability.
3. **Promoting Dynamic Interactions**—Encouraging continuous adaptation to address emerging challenges, driving sustained innovation and competitive advantage.

By aligning institutional frameworks with technological advancements, this framework transforms potential rivalries into synergistic opportunities, fostering long-term ecosystem resilience, growth, and value creation in an interconnected world.

8. Conclusions

This study uses S-D Logic as a guiding lens to explore the interplay of technology and institutional frameworks in fostering sustainable value co-creation within coopetition networks. This study offers theoretical insights and practical implications for organizations navigating the complexities of competition and collaboration in technology-driven ecosystems by addressing the fundamental questions surrounding technology's role, institutional configurations, and value distribution.

The findings reveal that technology serves as both an enabler and a driver of coopetition, functioning as an operant resource that fuels innovation, predictive analytics, and knowledge sharing and an operand resource that provides the infrastructure necessary for seamless coordination and secure interactions. Technologies such as AI, blockchain, and cloud computing, among others, enhance trust and transparency and facilitate resource

integration and adaptive decision-making, allowing firms to balance competitive tensions with collaborative synergies.

Beyond technology, this study underscores the critical role of institutional structures in ensuring effective coopetition. Regulative elements, such as contracts and industry standards, establish trust and operational consistency. Normative elements, including shared values and ethical norms, align organizational behaviours toward collective goals, and cognitive elements, such as common narratives and shared mental models, help actors coordinate strategies and minimize conflicts. These institutional dimensions create a resilient foundation for value co-creation when integrated with enabling technologies.

Sustaining coopetition networks requires a dynamic and iterative approach to value distribution. As actors continuously reconfigure and recombine their resources, institutional mechanisms must monitor and balance contributions and benefits, ensuring equitable participation and long-term stability. Technologies like blockchain can reinforce fairness and accountability, while data analytics offer real-time insights into value flows, promoting informed decision-making. Institutional work is at the heart of this dynamic process, enabling networks to adapt, evolve, and balance competitive differentiation and cooperative success.

Bringing these elements together, this study introduces a comprehensive framework built on seven systemic building blocks, including coopetition actors, resource integration, service exchange, institutional arrangements, nested service ecosystems, operand technologies, and operant technologies. This framework provides a structured approach to designing technology-enabled coopetition networks, offering a blueprint for firms to cultivate innovation, resilience, and sustainable value creation.

8.1. Limitations

While this study provides valuable conceptual insights into the role of technology in coopetition networks, it remains theoretical and requires empirical validation to assess its applicability in real-world settings. As a conceptual study, the findings are derived from a systematic synthesis of the existing literature and theoretical perspectives rather than direct empirical observations. While valuable for theory-building, this methodological approach presents several limitations that should be acknowledged.

One of this study's primary limitations is the lack of empirical validation. While the proposed framework integrates well-established theories—S-D Logic, Institutional Theory, and technology research—its practical applicability remains untested. Future research should seek to validate this model through case studies, industry surveys, or empirical network analyses, ensuring that the theoretical insights hold across diverse industries, business models, and market conditions.

Another limitation stems from potential selection bias in the literature review process. The conceptual framework was developed through a targeted academic literature review, prioritizing peer-reviewed journal articles and established theoretical contributions. However, there is always a risk that specific relevant perspectives, emerging theories, or industry-specific insights are unintentionally omitted. Future research could mitigate this by incorporating systematic literature reviews or meta-analyses, ensuring a more comprehensive and representative examination of coopetition dynamics.

This study adopts a generalized approach to coopetition, which may not fully account for sector-specific nuances. Coopetition strategies and technology adoption patterns can vary significantly across industries due to differences in regulatory environments, market structures, and competitive landscapes. For instance, coopetition in high-tech industries (e.g., platform-based digital ecosystems) may differ substantially from coopetition in traditional manufacturing or service sectors. Future studies should explore how

industry-specific characteristics influence the applicability of the proposed framework, thereby enhancing its Adaptability and relevance.

Another key limitation lies in categorizing technology as an operand or operant resource. While this classification helps clarify technology's role in coopetition, it may oversimplify how different technologies shape coopetition dynamics. For example, the impact of AI-driven decision-making, blockchain-enabled trust mechanisms, and IoT-facilitated resource sharing varies depending on the industry, firm size, and market maturity. Future research should conduct context-specific analyses to assess the differentiated impact of specific technologies in various coopetition scenarios.

Recognizing these limitations provides opportunities for further research and refinement. Empirical studies could apply mixed-method approaches, integrating qualitative case studies with quantitative modelling to test the robustness of the proposed framework. Moreover, cross-industry comparisons and longitudinal studies could provide deeper insights into how technology-driven coopetition evolves.

Despite these limitations, this study serves as a theoretical foundation for understanding the role of technology in coopetition ecosystems. By addressing these gaps, future research can enhance the proposed framework's empirical robustness, industry relevance, and practical applicability, contributing to academic discourse and strategic business practice.

8.2. Practical and Future Implications

This study offers practical guidance for businesses and policymakers on designing and managing technology-enabled coopetition networks. Firms must strategically leverage digital technologies to enhance collaboration while maintaining a competitive edge. For instance, predictive analytics can help identify areas of mutual benefit, while blockchain can ensure transparency in value-sharing agreements. Additionally, firms must actively engage in institutional work, aligning governance structures with evolving market demands to foster trust, Adaptability, and long-term sustainability.

A key takeaway is that coopetition should be viewed as a continuous process rather than a static strategy. Firms that continuously refine their collaborative efforts can unlock shared innovation opportunities, expand market reach, and enhance industry resilience. By recognizing competition and collaboration as complementary forces, businesses can navigate industry complexities more effectively and cultivate strategic partnerships that drive long-term value creation.

While this study lays a strong theoretical foundation, its real-world implications will only be fully realized through empirical validation. Future research should test and refine this framework through qualitative case studies, industry surveys, and empirical modelling, ensuring its relevance across diverse business contexts. As digital ecosystems continue to evolve, further exploration into the role of emerging technologies—such as AI-driven analytics, blockchain, and decentralized networks—will be essential to refining our understanding of how firms balance competition and collaboration in an increasingly interconnected world.

Ultimately, successfully navigating coopetition—leveraging technology as both a competitive tool and a collaborative enabler—will define the firms that thrive in the digital economy. Organizations that effectively integrate institutional stability, technological innovation, and cooperative strategies will be best positioned to lead in the evolving global landscape.

Author Contributions: A.A.d.S.—Conceptualization, Data curation, Writing—original draft, Writing—review and editing, Formal analysis, Project administration. A.J.M.C.—Conceptualization, Data

curation, Writing—review and editing, Formal analysis. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data supporting this study's findings are available from the corresponding author upon request.

Conflicts of Interest: The authors declare no conflict of interest to disclose.

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