



UNIVERSIDADE CATÓLICA PORTUGUESA

# Network Strategy and Management: Strategy in Ecosystems

Edivaldo Cassoma Venancio Gombe

Universidade Católica Portuguesa



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# Network Strategy and Management: Strategy in Ecosystems

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By

Edivaldo Cassoma Venancio Gombe

Supervised by

Prof. Dr. Luís Manuel Dionísio Marques

Universidade Católica Portuguesa

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# RESUMO

No atual ambiente empresarial bastante competitivo e interligado, as organizações operam cada vez mais no seio de ecossistemas, o que exige uma colaboração estratégica e a gestão de redes para alcançar um sucesso sustentável. Este estudo investiga o impacto das estratégias de rede nos resultados da gestão de ecossistemas, centrando-se na forma como as organizações concebem e implementam parcerias, alianças e redes de colaboração para melhorar a inovação, a resiliência e o desempenho.

A dissertação adotou uma abordagem quantitativa, recolhendo dados de 26 participantes envolvidos na gestão de ecossistemas em diferentes funções e sectores organizacionais. Os resultados revelaram que as estratégias de rede, particularmente as alianças estratégicas e as redes de inovação, desempenham um papel crucial na melhoria dos resultados dos ecossistemas. No entanto, desafios como barreiras de comunicação, recursos limitados e questões regulamentares foram identificados como obstáculos comuns.

Verificou-se que fatores internos como o apoio da liderança e uma cultura organizacional colaborativa, juntamente com fatores externos como a dinâmica do mercado e as mudanças tecnológicas, influenciam significativamente o sucesso das estratégias de rede.

Este estudo contribui para a literatura existente ao fornecer uma visão empírica das práticas de estratégia de rede nos ecossistemas portugueses e oferece recomendações práticas para as organizações que pretendem reforçar as suas capacidades de gestão de redes.

Palavras-chave: Rede, Estratégia, Gestão, Ecossistemas de Negócios.



# ABSTRACT

In the current competitive and interconnected business environment, organizations increasingly operate within ecosystems, requiring strategic collaboration and network management to achieve sustainable success. This study investigates the impact of network strategies on ecosystem management outcomes, focusing on how organizations design and implement partnerships, alliances, and collaborative networks to improve innovation, resilience, and performance.

The research adopted a quantitative approach, collecting data from 26 participants involved in ecosystem management across different organizational roles and sectors. The findings revealed that network strategies, particularly strategic alliances and innovation networks, play a crucial role in enhancing ecosystem outcomes. However, challenges such as communication barriers, limited resources, and regulatory issues were identified as common obstacles.

Internal factors like leadership support and a collaborative organizational culture, alongside external factors like market dynamics and technological changes, were found to significantly influence the success of network strategies.

This study contributes to the existing literature by providing empirical insights into network strategy practices within Portuguese ecosystems and offers practical recommendations for organizations aiming to strengthen their network management capabilities.

**Keywords:** Network, Strategy, Management, Business Ecosystems.

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# CHAPTER 1 – INTRODUCTION

## 1.1 Background of the Study

In today's complex and interconnected global economy, organizations no longer compete individually but as part of broader business ecosystems. These ecosystems consist of networks of interdependent firms collaborating to co-create value through shared technologies, knowledge, and resources (Moore, 1993).

Effective management of these networks requires well-designed strategies that foster cooperation, innovation, and adaptability, known as network strategies (Gulati et al., 2000). As ecosystems evolve and grow, understanding how network strategies influence management outcomes become increasingly important.

Portugal ranks as a "moderate innovator" with significant improvements in networked collaboration and digital infrastructure. Government initiatives such as Portugal Digital (República Portuguesa, 2020) and participation in European funding programs like Horizon Europe (European Commission, 2021) have further encouraged firms to integrate into innovation ecosystems. Moreover, the relatively smaller size of the Portuguese market incentivizes firms to collaborate and leverage external resources to remain competitive. However, there remains limited empirical research exploring how Portuguese firms engage with these strategies.

## **1.2 Problem Statement**

Despite the growing importance of network strategies in ecosystem management, organizations often face challenges in implementing these strategies effectively. Issues such as communication barriers, trust deficits, resource constraints, and governance complexities can hinder collaboration and ecosystem performance (Provan & Kenis, 2008; Ritala et al., 2021).

Portugal represents a compelling context for this study due to its growing emphasis on innovation, digital transformation, and collaborative business environments. According to the European Innovation Scoreboard (2023). There remains a need to explore how organizations in Portugal specially the ones investigated on the thesis, apply network strategies within their ecosystems and what factors contribute to their success or failure (Aarikka-Stenroos & Ritala, 2017; De Giovanni & Folgiero, 2023).

## **1.3 Research Objectives**

The objectives of this study are:

To identify the types of network strategies used by organizations in ecosystem management.

To assess the effectiveness of these strategies in improving ecosystem outcomes.

To understand the challenges organizations face in implementing network strategies.

To provide recommendations for enhancing network strategy practices.

## 1.4 Research Question

What is the impact of network strategies on ecosystem management outcomes?

## 1.5 Significance of the Study

This research provides valuable insights for both academics and practitioners by:

Contributing to the growing literature on network strategy and ecosystem management.

Offering practical recommendations for organizations seeking to improve their collaborative practices.

Enhancing understanding of network dynamics within the Portuguese business context.

## 1.6 Structure of the Thesis

This thesis is structured into six chapters:

- **Chapter 1- Introduction:** Introduces the research problem, objectives, relevance, and outlines the study's structure.
- **Chapter 2- Literature Review:** Explores key theories and concepts related to network strategy and ecosystem management, including governance models, digital transformation, trust, and sustainability, and highlights recent studies and the identified research gap.
- **Chapter 3- Research Methodology:** Details the research design, approach, data collection instruments, sample selection, and the techniques used to analyze the data.



- **Chapter 4- Data Analysis and Findings:** Presents the empirical results from the survey data, including types of strategies applied, challenges encountered, and internal/external influencing factors.
- **Chapter 5- Discussion and Recommendations:** Interprets the findings considering the reviewed literature, identifies patterns, theoretical contributions, and offers practical recommendations for organizations.
- **Chapter 6- Conclusion:** Summarizes the main insights of the study, discusses its limitations, and proposes avenues for future research.

# **CHAPTER 2 – LITERATURE REVIEW**

## **2.1 Introduction**

In today's dynamic business environment, organizations rarely operate in isolation. Instead, they are embedded within complex networks known as business ecosystems. These ecosystems consist of interconnected firms that co-create value through collaborative strategies, shared resources, and dynamic partnerships (Moore, 1993). Network strategy, therefore, has emerged as a critical managerial approach that enables firms to navigate ecosystem complexities, achieve competitive advantage, and foster innovation (Gulati, Nohria, & Zaheer, 2000). This literature review critically examines existing studies related to network strategy and ecosystem management, integrating recent contributions from international scholars and aligning with the context of this thesis.

## **2.2 Defining Business Ecosystems and Network Strategy**

Moore (1993) first introduced the concept of business ecosystems as a structure where companies evolve symbiotically, sharing technologies, resources, and customers. Network strategy, in this context, refers to the intentional configuration of inter-organizational relationships aimed at achieving strategic objectives (Aarikka-Stenroos & Ritala, 2017).

According to Gulati et al. (2000), network strategy enhances a firm's access to information, innovation, and capabilities, positioning it effectively within an ecosystem. The growing complexity of business environments requires managers to carefully design their network positions to leverage collaborative advantages.

## **2.3 Network Governance and Management Models**

Provan and Kenis (2008) identified three primary governance models within networks:

### **1. Participant-Governed Network**

In this model, all members are equally involved in decision-making and coordination without a central authority. Governance is shared and decentralized, relying on high levels of trust, mutual dependence, and a common goal among members. This model is most effective in small networks where informal relationships and consensus are feasible (Provan & Kenis, 2008).

### **2. Lead Organization-Governed Network**

This model assigns governance responsibility to one dominant organization that oversees coordination and decision-making for the entire network. It is well-suited to situations where one actor has greater power, resources, or legitimacy, and where efficiency and rapid decision-making are necessary. However, it may lead to power imbalances or reduced engagement from other members (Provan & Kenis, 2008).

### **3. Network Administrative Organization (NAO)**

In this more formal structure, a separate administrative body is created specifically to manage the network. This neutral, dedicated entity is responsible for coordination, performance tracking, and conflict resolution. The NAO model is especially effective in large or diverse networks where participants have varying interests and require professional management to ensure coherence (Provan & Kenis, 2008).

Aarikka-Stenroos and Ritala (2017) highlighted that governance challenges in ecosystems revolve around managing relationships, ensuring alignment, and orchestrating resources effectively.

## 2.4 Digital Transformation and Technological Enablers

Recent technological advancements, especially in blockchain, digital platforms, and data analytics, have transformed network strategy execution (Mubarik et al., 2023). Blockchain technology enhances trust, transparency, and traceability within supply chain networks, strengthening ecosystem resilience.

Firms leveraging digital tools gain improved coordination capabilities, rapid information exchange, and enhanced security mechanisms across their networks (Ritala, Agouridas, Assimakopoulos, & Gies, 2021).

## 2.5 Circular Economy and Sustainable Ecosystem Strategies

De Giovanni and Folgiero (2023) introduced the concept of Circular Districts which local ecosystems promoting sustainable practices through shared infrastructures and resources.

Circular networks emphasize:

- **Resource Optimization:** Firms seek to reduce waste by reusing inputs, sharing energy and materials, and improving process efficiency across network members.
- **Waste Reduction:** Aimed at minimizing environmental impact, this principle focuses on recycling, recovery, and elimination of unnecessary by-products through joint initiatives.

- **Collaborative Sustainability Initiatives:** Organizations co-develop green innovations, co-invest in sustainable technologies, and align their goals toward broader circular economy targets.

By promoting these principles, circular networks not only support **ecological outcomes** but also contribute to **economic resilience and innovation** in ecosystems where sustainability is a strategic priority (De Giovanni & Folgiero, 2023).

This approach aligns with the broader ecosystem strategy discourse, where firms seek long-term environmental and economic benefits through network-based sustainability efforts.

## **2.6 Trust, Collaboration, and Relational Dynamics**

Trust remains a fundamental component of successful network strategy. Firms operating within ecosystems must foster relational mechanisms that promote transparency, mutual learning, and shared risk-taking (Gulati et al., 2000).

Studies emphasize that frequent communication, joint problem-solving, and a shared vision among network members enhance collaboration effectiveness and ecosystem performance (Aarikka-Stenroos & Ritala, 2017).

## **2.7 Recent Studies and Emerging Trends (2020-2024)**

Several recent studies contribute to advancing the understanding of network strategy within ecosystems:

### **Digital Ecosystems and Open Innovation**

Jacobides, Cennamo, and Gawer (2020) describe digital ecosystems as complex platforms where firms can co-evolve and co-create value. These ecosystems promote modularity, rapid scaling, and open innovation, allowing diverse actors to integrate services and innovations in real-time.

### **Post-Pandemic Resilience Strategies**

The COVID-19 pandemic intensified the focus on network resilience. Raimo, Vitolla, Marrone, and Rubino (2021) found that organizations increasingly restructured their supply networks for flexibility, redundancy, and agility, enhancing their ability to respond to systemic disruptions and market shocks.

### **Platform Ecosystems and Business Model Innovation**

Autio, Nambisan, Thomas, and Wright (2018) argue that platform-based ecosystems enable rapid experimentation and business model innovation. These ecosystems leverage digital tools to connect firms and users dynamically, accelerating strategic pivots and market responsiveness.

These studies highlight that network strategy is no longer limited to structural considerations but must integrate technological adaptability and resilience planning.

## **2.8 Conceptual Framework of This Thesis**

The conceptual framework for this study proposes that the success of network strategies in ecosystem management is shaped by the interplay of three core dimensions: **governance models**, **trust and relational mechanisms**, and **technological enablers**. These dimensions are not arbitrary, they are grounded in the patterns identified across the literature.

### **Governance Models**

Provan and Kenis (2008) demonstrate that different types of governance participant-governed, lead organization, and NAO, affect the efficiency and cohesion of inter-organizational networks. The choice of governance structure determines how decisions are made, resources are allocated, and coordination is achieved. Effective governance provides the formal backbone of any network, ensuring stability, accountability, and role clarity.

### **Trust and Relational Mechanisms**

As Gulati, Nohria, and Zaheer (2000) and Aarikka-Stenroos and Ritala (2017) argue, trust is a relational glue that enables cooperation in the absence of rigid control mechanisms. Trust fosters open communication, risk sharing, and joint problem-solving key elements in high-performing networks. In ecosystems, where formal contracts may be limited, these relational dynamics often define success or failure.

### **Technological Enablers**

Emerging digital tools such as blockchain, data-sharing platforms, and real-time analytics, act as structural enablers of network coordination and transparency (Mubarik et al., 2023; Ritala et al., 2021). These technologies reduce transaction costs, enhance traceability, and allow for faster and more secure interactions across firms. In modern ecosystems, technological infrastructure is often what makes complex collaboration feasible at scale.

These elements are examined in the empirical part of this research, supported by survey data.

## 2.9 Literature Gap and Research Contribution

While a substantial body of research has explored network strategies within ecosystems (e.g., Gulati et al., 2000; Provan & Kenis, 2008; Aarikka-Stenroos & Ritala, 2017), most studies have focused on contexts such as the U.S., Northern Europe. There is a notable scarcity of empirical research applying these frameworks to Portuguese business ecosystems, particularly in the post-digitalization and sustainability era.

Although Portugal has made significant strides in digital transformation—through initiatives like Portugal Digital (República Portuguesa, 2020)—and has improved its innovation capacity (European Commission, 2023), there is limited evidence on how these advancements translate into effective network strategy implementation. Specifically, few studies address how governance models, trust dynamics, and technological enablers are configured in Portuguese firms to support collaboration within ecosystems.

Furthermore, the impact of external pressures, such as EU green transition policies and competitive globalization, on Portuguese inter-organizational networks remains underexplored. These factors warrant localized analysis because the structure of Portuguese ecosystems composed largely of SMEs, niche exporters, and sector-based clusters differs from more centralized or corporatized models seen elsewhere in Europe (Raimo et al., 2021).

This study contributes to the literature by focusing on three core dimensions **governance models**, **trust-based relational mechanisms**, and **technological enablers** as key factors in network strategy execution. These elements were selected based on strong empirical and theoretical grounding in the literature



(e.g., Provan & Kenis, 2008; Gulati et al., 2000; Ritala et al., 2021), and because they consistently emerged as central to ecosystem success across various studies.

Their relevance is directly tied to the **research question**, which seeks to understand the impact of network strategies on ecosystem outcomes. Governance defines structure and decision-making, trust supports collaboration and risk-sharing, and technology enables coordination and scalability. Together, these dimensions provide a coherent and actionable lens for analyzing ecosystem performance.

# CHAPTER 3 — RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter describes the research methodology adopted for this study. It presents the research design, methods of data collection, sampling procedures, and techniques used to analyze the data. The methodology was structured to address the research question: “What is the impact of network strategies on ecosystem management outcomes?”

## 3.2 Research Design

This research applied a quantitative research design using a structured survey to gather primary data from respondents engaged in ecosystem management. The quantitative approach was chosen to objectively measure the relationships between network strategy practices and ecosystem management outcomes, in line with Creswell (2014).

## 3.3 Research Approach and Strategy

This study adopted a combined descriptive and exploratory research approach to examine how network strategies are applied within business ecosystems, particularly in the Portuguese context.

**Descriptive research** was employed to systematically document and present the characteristics of the respondents and their organizations. This included organization size, industry, role of respondents, and the presence and type of

network strategies used. Descriptive analysis helped establish a factual foundation for understanding who participates in these ecosystems and what types of strategies they currently employ.

**Exploratory research** was essential due to the relatively limited body of empirical work on network strategy in Portugal. This component allowed the study to go beyond basic profiling and investigate emerging trends, such as the influence of digital platforms, trust mechanisms, and governance structures on strategy implementation. It also enabled the identification of underlying challenges like communication barriers and resource constraints that may not have been fully captured in previous studies.

By combining both approaches, the methodology ensured a broad and deep perspective on network strategy in ecosystems. It aligned directly with the study's objectives: not only to describe current practices but also to uncover why and how certain strategies succeed or fail in practice. This design was also particularly suitable for informing both academic theory and managerial decision-making.

### **3.4 Population and Sampling**

The target population consisted of professionals working in Portugal at organizations that participate in business ecosystems. Those professionals were based in Porto and represent various sectors and organization sizes to reflect the diversity of the Portuguese business ecosystem, this included organizations that engaged in strategic alliances, supply chain partnerships, innovation networks, or other forms of collaborative inter-organizational relationships. The sampling method applied was convenience sampling, selecting respondents who were readily accessible and willing to participate.

A total of 35 questionnaires were distributed via Google Forms to professionals working in Portuguese organizations that participate in business ecosystems. Out of these, 26 valid responses were received, resulting in a response rate of approximately 74%.

### **3.5 Data Collection Method**

Primary data was collected using a structured questionnaire designed based on themes extracted from the literature review, including:

Types of network strategies

Ecosystem management challenges

Success factors for network strategy implementation

Perceived ecosystem outcomes

The survey was administered online to facilitate wider participation and ensure convenience for respondents.

### **3.6 Instrumentation (Survey Design)**

The questionnaire was designed using a combination of closed-ended questions and 5-point Likert-scale items. This approach allowed for both structured data collection and the quantification of subjective perceptions, which is essential for descriptive and exploratory research.

- **Closed-ended questions** were used to collect categorical information (e.g., organization size, sector, respondent's role) in a standardized way. These questions ensured clarity, ease of response, and comparability across participants.

- **Likert-scale questions** measured the intensity of agreement or perception regarding specific aspects of network strategies such as governance, trust, technological adoption, and perceived effectiveness. The 5-point scale allowed respondents to express degrees of opinion, from "strongly disagree" to "strongly agree."

#### **Why this method?**

- **Closed-ended questions** ensured standardized, easily comparable responses.
- **Likert-scale items** allowed for measuring the **degree of agreement or perception** regarding key variables like trust, governance, and technology.
- It supported the **descriptive and exploratory objectives** of the study, helping to identify patterns and trends in a systematic manner.

#### **Why not other methods?**

- **Open-ended or qualitative interviews** were not selected due to time constraints, the broader scope of the sample, and the need for quantitative summarization.
- **Qualitative methods** would have limited the ability to generalize findings or conduct meaningful statistical descriptions.

The structured questionnaire can be found on appendix 1.

Key sections of the survey were:

**Organizational Profile (Size, Role)**

**Importance of Network Strategies**

**Types of Strategies Used**

## Perceived Impact of Strategies

## Implementation Challenges

## Internal and External Factors Influencing Strategy Success

The instrument was designed based on previous literature, including Aarikka-Stenroos & Ritala (2017), De Giovanni & Folgiero (2023), and Mubarik et al. (2023), ensuring validity and relevance to ecosystem strategy contexts and studies recognized for their focus on **network strategies, inter-organizational collaboration, and ecosystem dynamics**.

- Aarikka-Stenroos & Ritala (2017) provide a framework for value co-creation in ecosystems, highlighting the strategic and relational mechanisms between firms. Their study directly informs the variables of **trust, governance, and collaboration** included in the questionnaire. They also emphasize the **need for empirical studies** across different national contexts, supporting this study's focus on Portugal business ecosystem.
- De Giovanni & Folgiero (2023) examine how network configurations and strategic alignments impact ecosystem performance, particularly through **technological integration**. Their approach aligns with the thesis's exploration of **technology as a strategic enabler** and motivates several Likert-scale items on digital platforms and innovation.
- Mubarik et al. (2023) investigate knowledge-based strategies within supply chains and ecosystems, offering validated constructs around resource sharing, strategic alignment, and performance outcomes. They also identify limitations in generalizability and call for **context-specific replication**, which this study addresses by applying their logic to the Portuguese ecosystem environment.

These sources were selected not only for their thematic alignment but also because they offer validated models and operationalizable variables relevant to this thesis. Additionally, all three studies highlight future research directions including the need to explore trust mechanisms, governance structures, and digital strategy effectiveness which are central to the present research.

### 3.7 Data Analysis Techniques

Data analysis was conducted using **Microsoft Excel**, which was selected for its ease of use, accessibility, and suitability for basic quantitative analysis in small to mid-sized samples.

The following techniques were applied:

- **Descriptive Statistics:** Frequencies and percentages were calculated to summarize participant characteristics and responses. This helped identify how common certain practices, perceptions, or strategies were among respondents.
- **Graphical Representation:** Bar charts, pie charts, and column graphs were created to visually display patterns in the data. Visual tools made it easier to spot trends and communicate findings clearly.
- **Interpretation of Trends and Patterns:** Through comparisons across variables (strategy type vs. perceived effectiveness), the study interpreted how certain network strategies were perceived in terms of success and challenges. Although no inferential statistics (e.g., regression) were applied, this exploratory analysis provided meaningful insights aligned with the research objectives.

Excel was appropriate given the exploratory nature of the study and the manageable sample size ( $n = 26$ ). It allowed for efficient handling of responses, basic cross-tabulation, and presentation of results in a format suitable for descriptive research.

### **The analysis focused on exploring**

#### **Prevalence of Different Network Strategies:**

The survey responses were examined to determine how commonly various network strategies (e.g., alliance-based, digital, circular) were adopted by organizations within business ecosystems. This helped identify dominant strategic patterns among Portuguese firms.

#### **Perceived Success Levels in Ecosystem Outcomes:**

Respondents rated the effectiveness of their strategies in achieving outcomes such as innovation, collaboration quality, adaptability, and sustainability. These ratings were aggregated to assess which strategies were associated with higher success perceptions.

#### **Key Challenges and Influencing Factors:**

The data also captured barriers to strategy execution such as lack of trust, governance complexity, or resource limitations and external factors like digital infrastructure or policy incentives. This allowed for a deeper understanding of what helps or hinders ecosystem strategy effectiveness.

This approach enabled a clear and structured presentation of empirical findings, supporting evidence-based managerial recommendations by



identifying key patterns in network strategies, their effectiveness, and the challenges faced by organizations within Portuguese business ecosystems.

### **3.8 Limitations of the Study**

The sample size was relatively small (26 respondents), limiting the generalizability of findings.

#### **Convenience Sampling and Selection Bias:**

The sample was based on voluntary responses from professionals accessible through online channels. This convenience sampling method may introduce selection bias, as respondents might share common characteristics such as greater digital engagement or interest in ecosystem strategies that are not representative of the broader population. This limitation was mitigated by clearly defining the sample criteria and transparently reporting the sample composition, ensuring readers can interpret findings within context.

#### **Reliance on Self-Reported Perceptions:**

The data relied on respondents' own perceptions of strategy effectiveness and organizational behavior. While this approach is valuable for capturing subjective insights, it may not fully reflect objective organizational outcomes. To address this, the survey included structured likert-scale items to improve consistency and reduce ambiguity in responses, and results were interpreted with appropriate caution.

#### **Suggestions for Future Research:**

Acknowledging these constraints, the thesis recommends that future studies employ larger, more diverse samples and triangulate quantitative findings with qualitative methods such as interviews or case studies to capture deeper organizational dynamics and validate perceptual data.

By addressing these limitations transparently, the study reinforces the validity of its findings while outlining clear pathways for future investigation.

### **3.9 Summary of the chapter**

This chapter outlined the methodology adopted in this research, detailing the research design, data collection methods, sampling strategy, and data analysis techniques. The approach was appropriate for addressing the research objectives and answering the main research question regarding the impact of network strategies on ecosystem management outcomes.

# CHAPTER 4: DATA ANALYSIS AND FINDINGS

## 4.1 Introduction

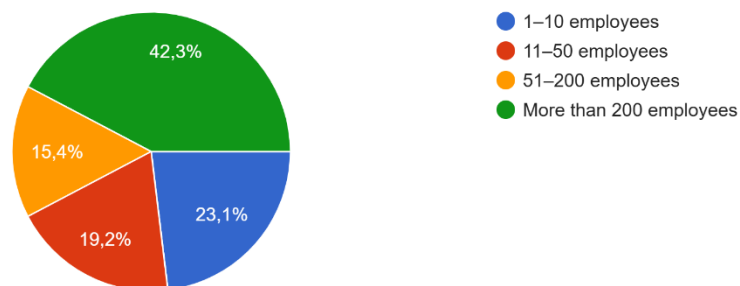
This chapter presents the analysis and interpretation of the updated survey data collected from 26 participants. The responses offer valuable insights into the practical application of network strategies within ecosystems, highlighting key practices, challenges, and influencing factors aligned with the literature review.

## 4.2 Organizational Characteristics of Respondents

### 4.2.1 Organization Size

1. What is the size of your organization?

26 respostas



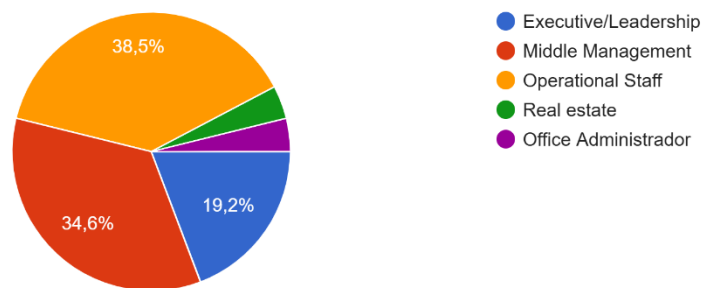
*Figure 1. Organization size*

*Source: Answers from survey*

The responses are well distributed among large organizations and SMEs, confirming the diversity of ecosystems studied.

#### 4.2.2 Roles within the Organization

2. What is your role within the organization?  
26 respostas



*Figure 2. Roles within the Organization*

*Source: Answers from survey*

Insights were drawn from both strategic decision-makers and operational employees, providing a balanced view of ecosystem management dynamics.

### 4.3 Importance of Network Strategies

3. How important are network strategies in your organization's ecosystem management?

26 respostas

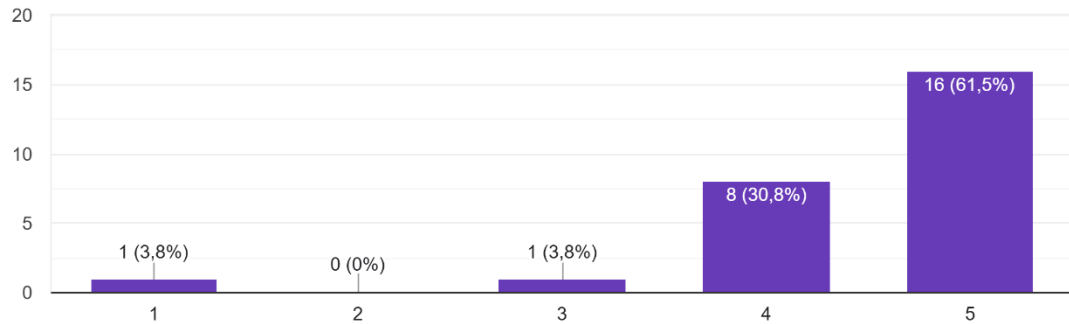


Figure 3. Importance of Network strategies

Source: Answers from survey

A clear majority perceive network strategies as crucial for ecosystem management.

### 4.4 Types of Network Strategies Applied

4. What types of network strategies does your organization use to manage its ecosystem ? (Select all that apply)

26 respostas

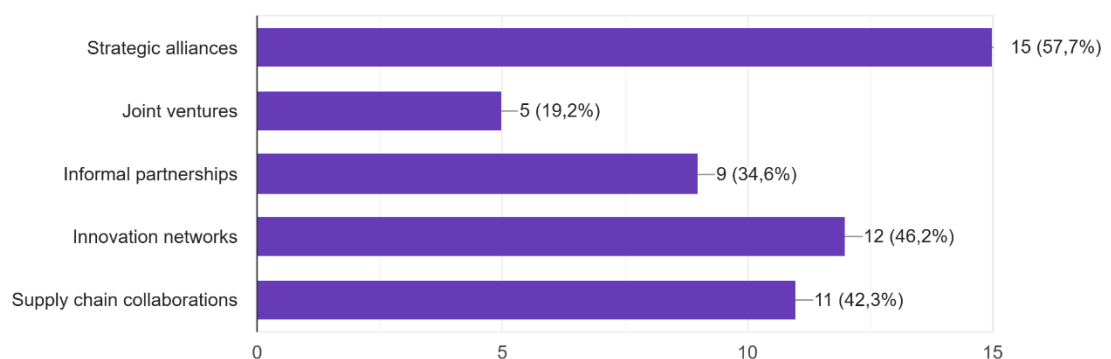


Figure 4. Types of Network Strategies Applied

Source: Answers from survey

Strategic alliances remain the preferred strategy.

## 4.5 Perceived Impact of Network Strategies on Outcomes

5. To what extent have these strategies improved the outcomes of your ecosystem management (e.g., innovation, collaboration, resilience)?

26 respostas

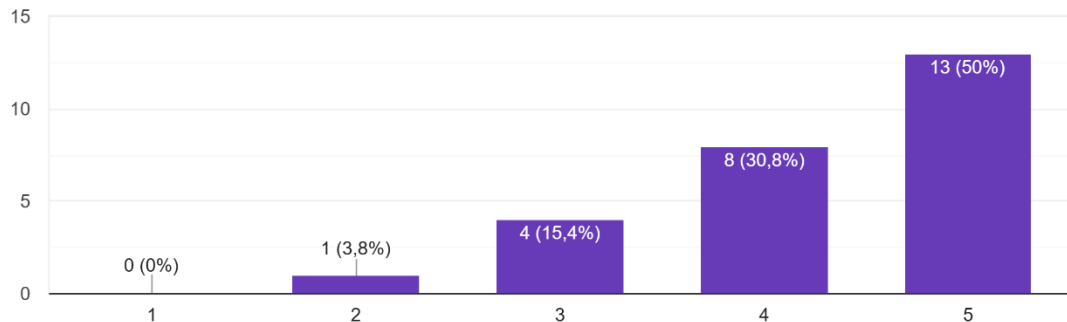


Figure 5. Impact of Network Strategies on Outcomes

Source: Answers from survey

The data demonstrates that most respondents consider network strategies highly impactful in improving ecosystem outcomes, including innovation, collaboration, and resilience.

## 4.6 Challenges in Implementing Network Strategies

6. What challenges does your organization face in implementing network strategies for ecosystem management? (Select all that apply)

26 respostas

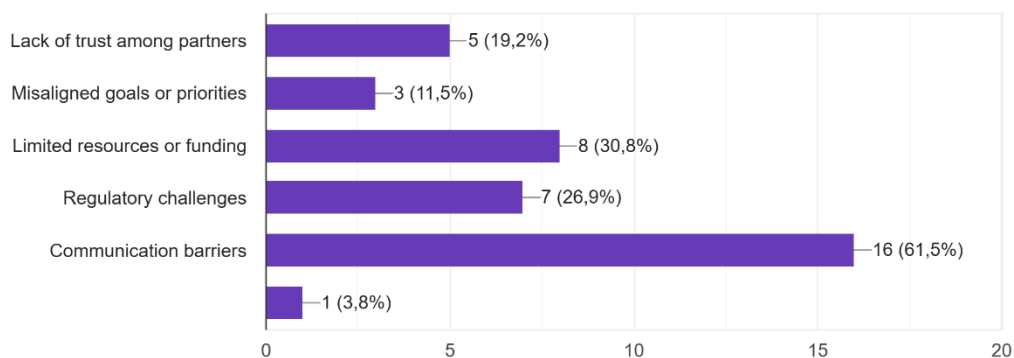


Figure 6. Challenges in Implementing Network Strategies

Source: Answers from survey

Communication barriers emerged as the most significant challenge.

## 4.7 Success of Network Strategies in Improving Specific Ecosystem Outcomes

7. How would you rate the success of your network strategies in improving the following ecosystem management outcomes? (Multiple choice for each option)

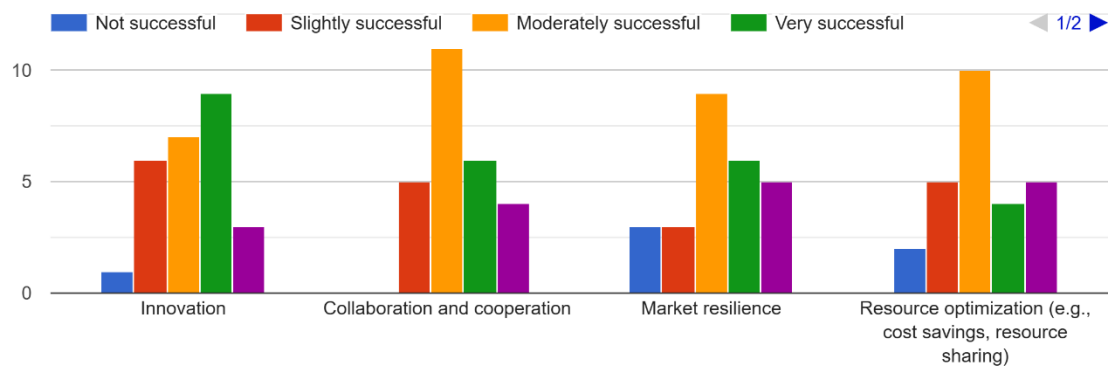


Figure 7. Success of Network Strategies

Source: Answers from survey



## 4.8 Internal Factors Enhancing Network Strategies

8. In your opinion, which internal factors are most important for the success of network strategies in managing ecosystems? (Select all that apply)

26 respostas

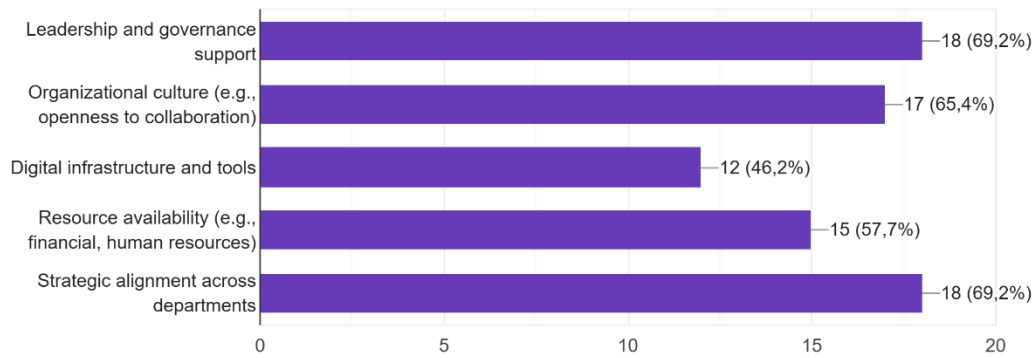


Figure 8. Internal Factors Enhancing Network Strategies

Source: Answers from survey

Leadership and organizational culture promoting collaboration are key internal drivers for effective ecosystem management.

## 4.9 External Factors Influencing Network Strategies

9. What external factors influence the success of network strategies for ecosystem management in your organization? (Select all that apply)

26 respostas

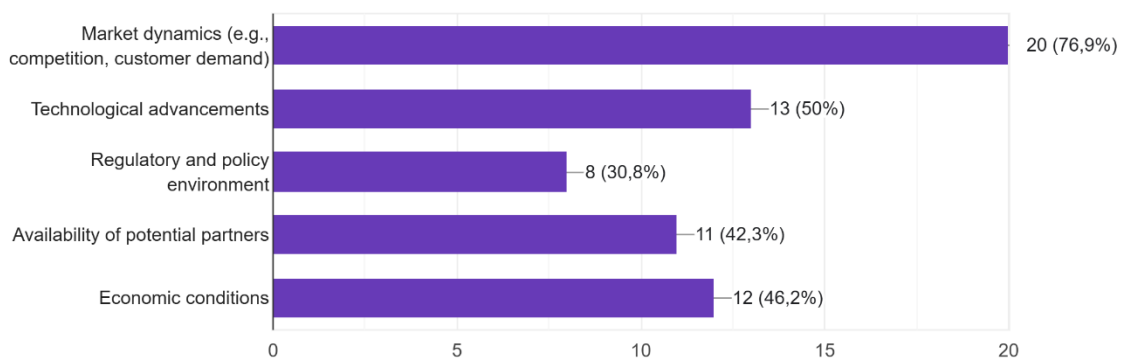


Figure 9. External Factors Influencing Network Strategies

Source: Answers from survey

Rapidly changing market conditions are a primary driver for organizations to develop adaptive network strategies.

### 4.10 Criticality of Network Strategy for Long-Term Success

10. How critical do you believe network strategy is for the long-term success of ecosystem management in your industry?

26 respostas

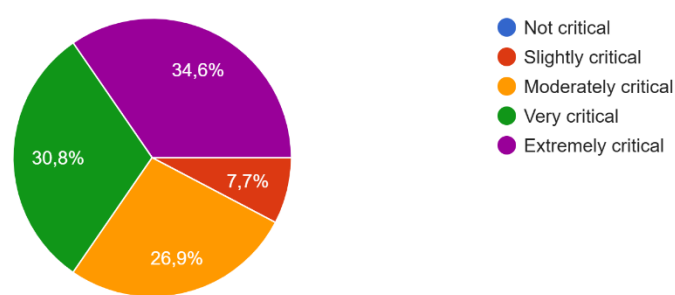


Figure 10. Criticality of Network Strategy for Long-Term Success

Source: Answers from survey

## **4.11 Summary of Key Findings**

Network strategies are recognized as critical for ecosystem management.

Strategic alliances, innovation networks, and supply chain collaborations are the most applied practices.

Communication barriers remain the greatest challenge.

Leadership and organizational culture strongly influence success.

Market dynamics are the most significant external factor shaping network strategies.

# CHAPTER 5 — DISCUSSION OF FINDINGS AND RECOMMENDATIONS

## 5.1 Introduction

This chapter presents a critical discussion of the research findings considering the literature reviewed. The discussion aims to interpret the results of the data analysis (Chapter 4) and connect them to existing academic knowledge and theoretical frameworks. The insights obtained offer valuable contributions to both theory and practice regarding network strategy and ecosystem management.

## 5.2 Discussion of Findings

### Question 1 — Organization Size

The results showed that most respondents (42,3%) belonged to large organizations with over 200 employees, while 23,1% were from small firms with 1–10 employees.

This distribution confirms the literature (Moore, 1993; Aarikka-Stenroos & Ritala, 2017) highlighting that ecosystems involve both large firms and smaller actors, each playing critical but different roles in value creation.

### Question 2 — Role within the Organization

The findings showed a balanced representation:

Operational Staff (38,5%)

Middle Management (34,6%)

Executives/Leaders (19,2%)

This supports Provan & Kenis (2008), who argued that network strategy requires insights from multiple levels of an organization to ensure alignment and effective governance.

### **Question 3 — Importance of Network Strategies**

The results revealed that 61,5% of respondents considered network strategies extremely important. This strongly confirms Gulati et al. (2000) who emphasized the strategic relevance of networks in improving resource access and competitive positioning within ecosystems.

### **Question 4 — Types of Network Strategies Used**

Respondents mostly use:

Strategic Alliances (57.7%)

Innovation Networks (46%)

Supply Chain Collaborations (42%)

This diverse strategy adoption indicates that organizations operate within multiple relational structures, confirming Aarikka-Stenroos & Ritala (2017), who highlighted that network strategy today is multi-layered and flexible, adapting to both formal and informal settings within ecosystems.

### **Question 5 — Perceived Impact of Network Strategies**

Respondents rated network strategies as highly successful in improving:

Innovation (46%)

Market Resilience (42%)

Collaboration (38%)

Resource Optimization (35%)

These results align with De Giovanni & Folgiero (2023), confirming that network strategies drive co-innovation, strengthen resilience, and facilitate knowledge flows, though resource optimization appears less impacted, suggesting operational efficiency in networks still needs development.

**Question 6 – Challenges in Implementing Network Strategies**

The main challenges identified were:

Communication Barriers (62%)

Limited Resources (31%)

Regulatory Issues (27%)

These results are consistent with Provan & Kenis (2008), who emphasized that communication and resource constraints often limit the effectiveness of network governance. Trust and goal alignment remain essential but appear to be less of a problem compared to operational and communicative aspects.

**Question 7 – Success of Network Strategies in Specific Outcomes**

| Outcome                     | Extremely/Very Successful |
|-----------------------------|---------------------------|
| Innovation                  | 46.2%                     |
| Collaboration & Cooperation | 38.5%                     |
| Market Resilience           | 42.3%                     |
| Resource Optimization       | 34.6%                     |

*Table 1. Success of Network Strategies in Specific Outcomes*

*Source: Answers from survey*

These findings indicate that network strategies are most successful in enabling innovation and resilience. However, while collaboration and resource optimization are recognized as positive aspects of ecosystem engagement, the findings suggest that these areas remain underleveraged by many actors. This points to persistent gaps in the governance structures and the articulation of shared strategic objectives across network participants (Ritala et al., 2021). Weak alignment in goals or insufficient coordination mechanisms can limit the potential of ecosystems to achieve collective efficiency and innovation.

This study contributes to the literature by empirically highlighting that even in environments with digital connectivity and innovation incentives such as Portugal, collaborative practices may fall short without supportive governance. It underscores the importance of developing relational mechanisms, such as trust-building and communication routines, and formal structures, such as shared KPIs or joint planning frameworks. This insight adds nuance to existing theories of ecosystem collaboration by showing that **technical and relational enablers** must be balanced to fully realize the benefits of network strategies.

### **Question 8 — Internal Factors for Network Strategy Success**

The most important internal factors were:

Leadership & Governance Support (69.2%)

Collaborative Culture (65.4%)

Digital Infrastructure (46.2%)

This strongly reflects Gulati et al. (2000), who argued that internal enablers such as leadership commitment and culture set the foundation for successful external network engagement.

### **Question 9 — External Factors Influencing Network Strategies**

The top external drivers were:

Market Dynamics (76.9%)

Technological Changes (50%)

Economics Conditions (46.2%)

These findings confirm Ritala et al. (2021) who argued that ecosystems are driven by external pressures, requiring adaptive strategies that respond to market shifts and technological evolution.

### **Question 10 — Criticality of Network Strategy for Long-Term Success**

Respondents confirmed the critical role of network strategies, with:

Extremely critical (34.6%)

Very critical (30.8%)

Moderately critical (26.9%)

Slightly critical (7.7%)

This reinforces Moore's (1993) view that ecosystems are sustained by firms' ability to collaborate and evolve together strategically.

## **5.3 Emerging Patterns & Insights**

Firms of all sizes participate in ecosystems.

Strategic alliances and innovation networks dominate strategy use.

Communication remains the top challenge.

Innovation and resilience are clear benefits of network strategies.



Leadership, culture, and digital readiness are essential internal enablers.

Market dynamics drive ecosystem strategy evolution.

The adoption of digital tools such as blockchain, digital platforms, and data-sharing infrastructures is increasingly recognized as essential to improving trust, transparency, and traceability in business ecosystems. These technologies reduce information asymmetry and enable more reliable coordination among diverse actors (Treiblmaier, 2018). At the same time, the complexity of ecosystem dynamics is driving the emergence of hybrid governance models that blend formal contracts with relational norms and digital control mechanisms (Provan & Kenis, 2008; Rai et al., 2012).

These developments signal a shift in network strategy from static, structure-based approaches toward dynamic, technology-enabled, and context-sensitive models. Managers are now required to adopt adaptive strategies that integrate technological capabilities with human factors such as trust, mutual adjustment, and shared purpose.

This study contributes to the literature by empirically validating that network strategies are evolving beyond traditional governance frameworks. It emphasizes the interplay between technological enablers and governance innovation, offering new insights into how firms can navigate digital transformation while maintaining effective collaboration. By doing so, it extends existing theories on ecosystem management and provides a foundation for future research into digitally mediated trust and coordination.

## **5.4 Managerial Implications**

To enhance the effectiveness of network strategies within business ecosystems, managers should adopt a multidimensional approach that addresses both organizational and inter-organizational factors:

### **Strengthen Internal Leadership and Collaborative Culture:**

Leadership commitment is critical to driving a culture of openness, knowledge sharing, and inter-firm collaboration. When top management visibly supports ecosystem engagement, it legitimizes collaborative initiatives and encourages alignment across departments. This reinforces findings in the literature that emphasize the role of leadership in shaping network orientation and trust-building (Zaheer, McEvily, & Perrone, 1998).

### **Invest in Communication Tools to Overcome Barriers:**

Communication breakdowns are a frequent barrier in networked environments. By investing in digital communication platforms and structured information-sharing processes, firms can reduce coordination costs and improve relational quality. This supports research highlighting the role of ICT in facilitating real-time collaboration and governance in ecosystems (Nambisan et al., 2017).

### **Align Network Strategies with External Market Demands:**

Ecosystem participation must not be isolated from competitive strategy. Organizations that align their collaborative efforts with emerging market trends and customer needs tend to create more sustainable value propositions. This reinforces the notion that external fit is as important as internal alignment in strategy execution (Gulati, Nohria, & Zaheer, 2000).

### **Focus on Innovation-Driven Partnerships:**

Ecosystems offer an ideal environment for co-innovation. Managers should prioritize partnerships that enable experimentation, joint R&D, and rapid scaling of new solutions. This recommendation extends prior literature by emphasizing the strategic orchestration of innovation ecosystems, where value creation depends on both technological complementarity and shared vision (Adner, 2017).

By translating empirical findings into actionable guidance, this study contributes to the literature on network strategy by bridging theory and practice. It refines our understanding of the managerial levers that influence ecosystem performance and highlights the importance of integrating leadership, digital tools, market responsiveness, and innovation focus into network strategy formulation. These findings offer a grounded framework for future studies aiming to operationalize success factors in ecosystem-based management.

## **5.5 Contributions to Theory and Practice**

This research makes a significant contribution to the theory of ecosystem management and network strategy by empirically validating the strategic importance of network configuration and collaboration mechanisms in enhancing ecosystem performance. Through data collected from ecosystem participants in Portugal, the study confirms that well-designed network strategies are essential to achieving outcomes such as innovation, adaptability, and resource efficiency.

One major theoretical contribution lies in the integration of emerging concepts into the traditional network strategy framework:

- **Circular Districts**, as discussed by De Giovanni and Folgiero (2023), illustrate how industrial clusters are evolving into collaborative, resource-optimized ecosystems where waste is minimized, and value is co-created. By including this concept in the empirical exploration, the study extends existing models of linear industrial networks toward circular and sustainability-driven frameworks.
- **Digital transformation in network management**, as emphasized by Mubarik et al. (2023), is also shown to play a pivotal role. This research validates their proposition that digital enablers, such as data platforms and ICT tools, are not just supportive but central to effective ecosystem governance and strategic coordination. Thus, this study contributes by demonstrating how digital technologies operationalize trust, flexibility, and responsiveness in practice.

Moreover, the findings offer **practical contributions** to managers seeking to navigate the complexity of modern ecosystems. Specifically, the study emphasizes the need to:

- Prioritize **internal leadership support** to ensure strategic alignment and motivation across teams;
- Cultivate a **collaboration-oriented culture** that promotes openness and mutual value creation;
- Address **communication barriers** through digital tools and structured governance, improving inter-organizational transparency and efficiency.

## **5.6 Recommendations**

### **5.6.1 Recommendations for Network Strategy Development**

#### **Foster Strategic Alliances and Innovation Networks**

Organizations should prioritize the development of strategic alliances and innovative networks to strengthen their position within ecosystems. As shown in this study, these strategies are widely used and highly effective in promoting collaboration, knowledge sharing, and innovation (Aarikka-Stenroos & Ritala, 2017), this can be accomplished by establishing formal agreements with ecosystem partners focusing on shared goals and joint innovation initiatives.

#### **Embracing Digital Technologies to Enable Network Strategies**

The integration of digital platforms, including blockchain, data-sharing systems, and collaborative tools, can significantly enhance trust, transparency, and coordination within ecosystems (Mubarik et al., 2023), this can be accomplished by investing in technological infrastructure that facilitates real-time communication, resource sharing, and data transparency.

#### **Promoting Organizational Culture for Collaboration**

Collaborative organizational culture is essential for successful network strategy implementation. Leadership should encourage openness, trust, and teamwork across departments and with external partners, one way of achieving this is by providing internal training and workshops focused on collaboration skills and ecosystem thinking.

### **5.6.2 Recommendations for Overcoming Implementation Challenges**

#### **Address Communication Barriers**

Communication barriers were identified as the most significant challenge in implementing network strategies. Organizations should develop structured communication frameworks within their ecosystems by establishing regular meetings, clear communication protocols, and digital collaboration platforms to facilitate information flow.

#### **Allocate Resources Strategically**

Limited resources or funding were reported as challenges. Ecosystem strategies should include budget allocations for network development and maintenance and designate specific resources (financial, human, technological) to support network management activities.

#### **Align Goals and Expectations with Partners**

Misaligned goals between ecosystem members can create obstacles. Organizations should ensure alignment through clear negotiations and shared vision setting by engaging in co-creation sessions with partners to define mutual objectives and KPIs for ecosystem projects.

### **5.6.3 Enhancing Ecosystem Performance through Network Management**

#### **Develop Hybrid Governance Models**

To address the governance challenges identified, firms should consider hybrid governance approaches combining centralized leadership with participatory decision-making (Provan & Kenis, 2008), this can be implemented by assigning

lead coordinators while maintaining inclusive processes for all ecosystem members.

### **Monitor and Evaluate Network Strategy Performance**

Performance measurement is essential to assess the effectiveness of network strategies, this can be implemented by establishing performance indicators focusing on collaboration quality, innovation output, trust levels, and ecosystem resilience.

#### **5.6.4 Recommendations for Future Research**

While this study offers meaningful insights into the implementation and outcomes of network strategies within Portuguese business ecosystems, several avenues remain open for further academic inquiry:

##### **Longitudinal Studies on Network Strategy Impacts:**

This research provides a snapshot of current practices and perceptions. However, network strategies evolve as ecosystems mature. Future research should adopt a longitudinal design to observe how strategic decisions, trust mechanisms, and collaborative outcomes develop over time. This would allow scholars to assess the sustainability and long-term effectiveness of different network configurations and governance models (Provan & Kenis, 2008).

##### **Qualitative Exploration of Relational Dynamics:**

While quantitative methods help identify trends and correlations, the relational and behavioral dimensions of network collaboration require deeper understanding. Future studies could use interviews, case studies, or ethnographic approaches to explore how trust, power, leadership, and shared vision are constructed and maintained in practice. This would complement

current findings and enrich the literature on relational governance (Ring & Van de Ven, 1994).

#### **Sector-Specific Comparative Studies:**

Ecosystem dynamics can differ significantly across sectors such as technology, manufacturing, healthcare, and circular economy. Further research could conduct sector-specific investigations to understand the unique strategic drivers, constraints, and governance challenges in each context. Comparative studies may reveal sectoral best practices and help refine theoretical models by introducing contextual contingencies.

#### **Larger and More Diverse Samples:**

This study's sample was limited in size and scope, which may affect the generalizability of the results. Future research should aim to expand the sample, both geographically and demographically, to capture a wider range of ecosystem experiences. Inclusion of firms of different sizes, stages of development, and regional contexts would allow for robust statistical validation and cross-sectional analysis.

#### **Integration of Emerging Technologies in Ecosystem Strategies:**

The evolving role of digital technologies (e.g., blockchain, AI, platforms) in network strategy warrants focused study. Future research could examine how technological enablers reshape governance, decision-making, and value co-creation across different ecosystem models. This direction aligns with the increasing need for adaptive and tech-driven strategic approaches (Jacobides et al., 2020).



These future research perspectives not only extend the findings of this study but also contribute to advancing the theoretical foundation and practical understanding of network strategy in ecosystem contexts.

## 5.7 Summary of Chapter

This chapter discussed the research findings sequentially from Questions 1 to 10, linking them with the existing literature. The study confirmed the vital role of network strategies in managing ecosystems, highlighting their impact on innovation, resilience, and collaboration. However, challenges like communication gaps and resource constraints must be addressed to fully capture the benefits of network participation.

The chapter also provided actionable recommendations for enhancing network strategy implementation and ecosystem management. The suggestions emphasize the importance of strategic alliances, digital technology adoption, organizational culture, clear communication, and governance models.

By applying these recommendations, organizations operating within ecosystems can improve collaboration, innovation, and resilience, ensuring sustainable competitive advantage.

## CHAPTER 6 – CONCLUSION

This study examined the impact of network strategies on ecosystem management outcomes, focusing on how organizations develop and implement strategic collaborations within business ecosystems.

The research findings confirmed that network strategies, especially strategic alliances and innovation networks, are essential tools for enhancing innovation, collaboration, and resilience in ecosystems. The study also revealed that leadership support, organizational culture, communication, and technology adoption play a vital role in the success of these strategies.

Despite these benefits, challenges such as communication barriers, limited resources, and regulatory constraints remain key obstacles for many organizations.

This research contributes to both theory and practice by integrating recent literature with empirical evidence from Portuguese firms. It offers actionable recommendations for improving network strategy practices and ecosystem management, emphasizing the importance of trust, governance, digital tools, and collaborative culture.

Future research should expand on these findings by exploring larger and more diverse samples, qualitative insights, and the long-term evolution of network strategies in various industries.

Overall, network strategies are not just operational choices but strategic necessities for organizations aiming to thrive in increasingly interconnected business ecosystems.

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# APPENDIX 1

## **Network Strategy and Management: Strategy in Ecosystems**

This survey aims to understand how organizations develop and manage network strategies within business ecosystems. Your responses will remain confidential.

### **1. What is the size of your organization?**

- ☐ 1–10 employees
- ☐ 11–50 employees
- ☐ 51–200 employees
- ☐ More than 200 employees

### **2. What is your role within the organization?**

- ☐ Executive/Leadership
- ☐ Middle Management
- ☐ Operational Staff
- ☐ Outra: \_\_\_\_\_

### **3. How important are network strategies in your organization's ecosystem management?**

Not important

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5

Extremely important

**4. What types of network strategies does your organization use to manage its ecosystem?**

*(Select all that apply)*

- ☐ Strategic alliances
- ☐ Joint ventures
- ☐ Informal partnerships
- ☐ Innovation networks
- ☐ Supply chain collaborations

Outra: \_\_\_\_\_

**5. To what extent have these strategies improved the outcomes of your ecosystem management (e.g., innovation, collaboration, resilience)?**

No improvement

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5

Significant improvement

**6. What challenges does your organization face in implementing network strategies for ecosystem management?**

*(Select all that apply)*

- ☐ Lack of trust among partners



- ☐ Misaligned goals or priorities
- ☐ Limited resources or funding
- ☐ Regulatory challenges
- ☐ Communication barriers
- ☐ Outra: \_\_\_\_\_

**7. How would you rate the success of your network strategies in improving the following ecosystem management outcomes?**

(Multiple choice for each option)

- |                                        |                                                |
|----------------------------------------|------------------------------------------------|
| 1. Innovation                          | <input type="checkbox"/> Not successful        |
| 2. Collaboration and cooperation       | <input type="checkbox"/> Slightly successful   |
| 3. Market resilience                   | <input type="checkbox"/> Moderately successful |
| 4. Resource optimization               | <input type="checkbox"/> Very successful       |
| (e.g., cost savings, resource sharing) | <input type="checkbox"/> Extremely successful  |

**8. In your opinion, which internal factors are most important for the success of network strategies in managing ecosystems?**

(Select all that apply)

- ☐ Leadership and governance support
- ☐ Organizational culture (e.g., openness to collaboration)
- ☐ Digital infrastructure and tools
- ☐ Resource availability (e.g., financial, human resources)
- ☐ Strategic alignment across departments
- ☐ Outra: \_\_\_\_\_

**9. What external factors influence the success of network strategies for ecosystem management in your organization?**

(Select all that apply)

- ☐ Market dynamics (e.g., competition, customer demand)
- ☐ Technological advancements
- ☐ Regulatory and policy environment
- ☐ Availability of potential partners
- ☐ Economic conditions
- ☐ Outra: \_\_\_\_\_

**10. How critical do you believe network strategy is for the long-term success of ecosystem management in your industry?**

- ☐ Not critical
- ☐ Slightly critical
- ☐ Moderately critical
- ☐ Very critical
- ☐ Extremely critical