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Article

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Article

Strategic Networks' Dynamics: Evidence of Member Firms' Retention and Departures in Brazil

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Abstract: Strategic Networks (SNs) have emerged as a prevalent organizational form that offers synergistic benefits to participating firms. Despite their potential, SNs often experience member firms' departure, raising concerns about their long-term viability. This study explores the factors that influence firms' decisions to exit SNs by examining the interplay between network maturity, member firms' satisfaction, and their individual characteristics. Using data from 338 Brazilian firms involved in SNs, a cluster analysis was employed to identify distinct groups of firms based on shared attributes. The findings revealed a significant association between higher perceived maturity, greater satisfaction with SNs, and lower likelihood of departure. These results suggest that network leaders should prioritize cultivating a mature and satisfying SN environment to mitigate member exits. By identifying the critical distinctions between the remaining and departing firms, this study provides valuable insights for network managers seeking to strengthen the longevity and stability of their strategic partnerships.



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Keywords: strategic network; cooperation failure; cluster analysis; member firms' departure; network dissolution

1. Introduction

Cooperation between small- and medium-sized firms has led to the formation of inter-organizational networks to minimize the scarcity of resources faced by these firms, generating greater financial efficiency (Emami et al. 2022), opportunities for collective learning (He et al. 2021) and collaborative innovations (Cheboi et al. 2022). Formal and long-term cooperative agreements among the forms of inter-organizational networks define Strategic Networks (SNs). Through SNs, companies establish a joint purpose and form of relationship governance to achieve common goals and to generate competitive advantages (Mandell et al. 2017; Trąpczyński et al. 2018; Antoldi and Cerrato 2020; Wegner et al. 2022).

Despite a large number of studies on SNs in recent decades (Trąpczyński et al. 2018; Antoldi and Cerrato 2020), there are still gaps in the knowledge about how to manage them (Agostini et al. 2015) and how they develop over time (Giuliani 2013; Popp et al. 2013). Several studies indicate that despite the success of this cooperation model, a significant number of SNs face difficulties in consolidating, and a considerable number fail (Klein and Pereira 2016; Tunisini and Marchiori 2020).

Recent studies have sought to identify the stages of SN development, making it possible to understand the changes that occur over time and how some SNs assume upward

trajectories while others decline (Wegner et al. 2015; Klein and Pereira 2016). Through the development of a SN, different problems can arise (Tunisini and Marchiori 2020).

Given this reasoning, this study addresses the following question: What factors drive the decision of network member firms to leave the network? This study aims to understand how network performance can be related to member firms' satisfaction and their tendency to leave the SN.

Data were collected from 338 firms that participated in Brazilian SNs. We then performed a cluster analysis to associate firms with common characteristics in groups to understand the main factors that affect the permanence of one or more members. This analysis can help network managers act before a member asks to leave the network by planning targeted actions to increase member firms' satisfaction with those factors that affect member firms' permanence. Thus, it can enhance the survival of a SN.

2. Literature Review

2.1. Strategic Network Dynamics

In research about chambers of commerce, Costanzo and Goodnight (2015) support the idea that the existence and longevity of membership-driven non-profit organizations depend on membership retention and recruiting. When the network fails to retain members, when they stop participating in its activities, and when they leave the network, it starts to fail and may dissolve.

Two network outcomes predict membership retention: member firms' satisfaction and continuity. Members' satisfaction is defined as the degree to which network members believe that being part of the network and interacting with other network members have exceeded their expectations. Network continuity refers to a group's willingness to continue collaborating and being part of the SN. In this way, members' perceptions of the network predict their future participation and support (Bradford et al. 2004).

Despite some research that evaluates and comprehends the failure and dissolutions of networks (e.g., Tunisini and Marchiori 2020), no empirical research is available that assesses members' satisfaction and continuity in SNs. The relationships based on SNs are "built to adapt" because they must adapt according to the competitive environment, dynamics of resources, new strategies, and ties between partners (Abbas et al. 2019). Through this dynamic development process, many challenges may be faced during different growth phases (Tunisini and Marchiori 2020). Also, during its development, the SN can perform successful changes that increase member firms' satisfaction and boost network performance. Still, some changes can lead the opposite way, contributing to poor satisfaction or less network performance.

Some researchers proposed frameworks and models to better understand a SN's dynamic development profile. Tunisini and Marchiori (2020) presented five factors that affect network dynamics: individual variables, structural characteristics, legitimacy variables, interaction variables, and governance variables. Similarly, some authors propose that organizational and relational changes dictate its development (e.g., Wegner et al. 2015; Moretti and Zirpoli 2016). The five factors presented by Tunisini and Marchiori (2020) can be grouped into relational and organizational aspects, as individual and interactional variables are related to relational factors, and structural, legitimacy, and governance are directly related to the organizational aspects of a SN. In this way, to conduct our research, we considered organizational and relational aspects as the ones that influence SN development, and by their perception, they can assess network outcomes, member firms' satisfaction, and continuity.

Since organizational and relational dimensions are latent constructs, and aspects that cannot be directly observed or measured, they must be analyzed from the perspective of the construction of psychometric scales. This perspective aims to ensure the validity and reliability of the results (Pasquali 2009). We chose to apply the survey developed by Wegner et al. (2015), as it covers organizational and relational dimensions to evaluate the development of a SN and has evidence of validity as presented by Braga et al. (2022). In

Table 1, the organizational and relational dimensions of SNs are presented and discussed in detail in the following section.

Table 1. Organizational and relational dimensions of strategic networks.

Dimension	Descriptor
Organizational	Management
	- Management structure
	- Strategy
	- Administrative procedures
	Governance
	- Decision-making
	- Formalization
	- Incentives and sanctions
	- Controls
	Process definition
	- Service offer
Relational	Information exchange
	Trust in management
	Trust in associates
	Interpersonal relationships

Source: Adapted from the study by [Wegner et al. \(2015\)](#).

2.2. Organizational Dimensions

SNs are a complex type of organization, mainly due to managing several actors and their shared activities simultaneously ([Macciò and Cristofoli 2017](#)). Management influences performance and results ([Olsen et al. 2012](#)). [Oliveira-Ribeiro et al. \(2021\)](#) highlighted that governance and management function as systems that present interrelationships that affect the network's efficiency level. They argue that analyzing this governance management system and the elements constituting each aspect in more detail is necessary. Understanding the functioning of SNs is important as well as how certain conditions and structures influence collective results ([Provan and Kenis 2008](#)).

The management of a network comprises organizational and managerial activities related to its development and operation ([Agostini et al. 2015](#)). Establishing an organizational structure is necessary to support its activities, protect members and institutions from external pressure, and explore external and internal opportunities ([Macciò and Cristofoli 2017](#)). The core management of a network is also responsible for controlling the entrance and exit of organizations into the group and mediating the relationships between organizations ([Oliveira and da Silva 2022](#)).

Governance delimits management ([Oliveira-Ribeiro et al. 2021](#)) through a structure of collective action that includes defining the rules for decision-making, responsibilities, and limits to participant autonomy ([Provan and Kenis 2008](#)). In addition to being a tool for engaging members in collective activities, it is also an essential instrument for monitoring and controlling network management.

Another organizational aspect of networks is the organization of services offered to member firms. The provision of services has become a network management responsibility that aims to facilitate companies' adaptation to market changes and increase their competitiveness ([Ferreira and Armagan 2011](#)). Training and qualifications, such as marketing, financial, and technology consultancy, stand out among the services offered.

2.3. Relational Dimensions

Networks have a dynamic profile because companies have different positions based on their connections with other members. These connections constantly change depending on how member firms combine resources and activities ([Abrahamsen et al. 2012](#)). Effective collaborative relationships between companies in a network require the development

of relational skills. Trust between members drives the achievement of collective goals (Chrupała-Pniak et al. 2017). In inter-organizational relationships, trust is a cyclical process established by leadership based on the mediation of relationships and agreements and the engagement of partners (Chrupała-Pniak et al. 2017).

In networks of small companies, each entrepreneur tends to know others personally and maintains relationships that existed before the formation of the network. Therefore, administration is more informal and guided by social mechanisms. However, with the entry of new members, the network becomes more complex, interpersonal relationships become scarce, and it is necessary to have a formalization process to guide actions and monitor the group's performance (Provan and Kenis 2008).

3. Method

This section describes the methodology used to understand how a SN's organizational and relational dimensions relate to its member firms' satisfaction and tendency to leave the SN. We present our sample, data collection procedures, main variables, and techniques to test our hypotheses. We used the cluster analysis technique, which allows observations to be grouped into homogeneous groups when there is an intention to verify the existence of similar behaviors between observations (Fávero and Belfiore 2017), as is the perception of members about SN organizational and relational aspects. In cluster analysis, based on research objectives, the researcher must choose cluster variables representing the characteristics used to compare observations and external variables to assess the differences among the clusters (Hair 2009; Fávero and Belfiore 2017).

3.1. Data Collection

A survey was conducted to evaluate the significance of the sample population (Groves et al. 2009). This technique requires a clear definition of the appropriate unit of analysis. Convenience sampling was used, as the choice of sample elements was carried out non-randomly, considering the particular characteristics of the group under study and the researchers' knowledge of what they were investigating. The study objects of the conceptual model were SNs, specifically those in the building materials trade sector.

We used the survey developed by Wegner et al. (2015), with evidence of validity presented by Braga et al. (2022). The survey consists of 41 questions on a five-point scale, ranging from "totally disagree" to "totally agree", that measures aspects regarding each descriptor detailed in Table 1.

The survey was sent digitally to 600 companies associated with 19 SNs in Brazil in the construction materials sector between July and August 2021. A total of 352 responses were obtained, resulting in a final sample of 338 after excluding incomplete responses. This sample comprised 56% of the expected responses from the study group. According to Moscarola (1990)'s Law of Large Numbers, a sample of 300 respondents is sufficient to obtain results that align with reality and have a lower chance of error (Moscarola 1990). Although the survey results using a convenience sample cannot be generalized to the entire population, they are a source of theoretical inferences for the reality studied.

3.2. Measures

The cluster variables used to characterize the companies in different clusters are the Organizational and Relational dimensions captured by the 40 questions of the survey applied to data collection (Appendix A).

The prediction variable is the probability of leaving a network, evaluated by one item: "What is the possibility that your company will disconnect from the network in the next 12 months?". The answer is categorically measured on a five-point scale with 0%, indicating no chance of leaving the network, with 25%, 50%, 75%, and 100% indicating that the company is sure that it will leave the network.

Additionally, we asked the member firms three questions regarding their satisfaction with the SN:

- (a) overall satisfaction with their membership in the SN: “I am fully satisfied with the benefits that participation in the network provides to my company”;
- (b) whether the results fully justified the costs of being part of the SN: “The results that my company is obtaining fully justify the costs of being part of the network”;
- (c) whether participation significantly increased their credibility in the market;
- (d) whether members are adherent to network strategies: “There is a high level of adherence by members to the collective strategies proposed by the network”.

These questions support and explain our analysis, covering the two network outcomes under study: member firms’ satisfaction and continuity.

3.3. Data Pre-Processing

To apply cluster techniques, data must be on a quantitative scale, as they are submitted to calculate matrices and averages. The initial data collected on a qualitative Likert scale cannot be analyzed using clustering techniques. It is necessary to convert these data into an ordinal quantitative scale obtained in this study by calculating factorial scores. Factor analysis is a statistical technique used to reduce the complexity and dimensionality of databases, allowing analysis of the structure of interrelationships between many variables (Hair 2009). This technique helps create smaller variables from the original set to facilitate subsequent statistical analyses (Hair 2009).

By applying confirmatory factor analysis through the semi-structural equation technique, we found that the survey had an optimal fit when represented by 13 latent variables. Factor scores were extracted for each respondent for each factor in the model and used as the input for the cluster technique.

3.4. Data Analysis

Clustering techniques are divided into hierarchical and nonhierarchical techniques. Based on statistical calculations, the number of appropriate clusters to estimate for the observations and variables under study was evaluated using the first group of hierarchical techniques. In non-hierarchical techniques, the number of clusters (n) is defined a priori, and statistical calculations are used to distribute the observations of the dataset in the n -defined clusters.

The hierarchical and nonhierarchical techniques presented comparable results. The results obtained using hierarchical techniques on an adequate number of clusters can serve as inputs for allocating observations using nonhierarchical techniques. Fávero and Belfiore (2017) suggest using both methods when there is no reasonable estimate of the number of clusters that can be formed using database observations and the variables under study.

Initially, the analysis performed a hierarchical clustering scheme to obtain the appropriate number of clusters for the dataset. The agglomerative method considers all observations to be separate. Based on the distances between observations, groups were formed, starting from several groups equal to the number of observations until a single group was formed. The complete linkage type was used to calculate the distances, considering the most significant distances between the observations for estimations, which is recommended when there is no considerable distance between observation values. We used the Euclidean quadratic distance, recommended when the variable values have a small dispersion, as it facilitates the interpretation of the analysis outputs and allocation of observations in the groups (Fávero and Belfiore 2017). The results were analyzed by interpreting the generated tree-type graph, a dendrogram that summarizes the agglomeration process and explains the allocation of observations in the groups (Fávero and Belfiore 2017). The analysis criterion for the magnitude of the distance gaps between the groups was used as the cutoff point. A gap of greater magnitude indicates that considerably different observations are clustered and do not meet the intracluster homogeneity criteria. Therefore, the subsequent agglomeration stage should not be considered. For the analysis of the dendrogram, the complete linkage method and the calculation of the distance using

the Euclidean quadratic resulted in a more evident and explicit gap, which favored the identification of the groupings and the cutoff point and, therefore, were chosen in this work.

The next step uses a non-hierarchical grouping technique to distribute the group observations. The number of groups obtained by using the hierarchical method was used as the input for the k-means method, which performs the distribution of observations because it is more accurate than hierarchical methods.

Certain variables must be evaluated to determine the distribution of the observations in the clusters. The objective of a cluster is to obtain internally homogeneous clusters, that is, clusters that have high similarities within each group (intra, within) and low similarities between each group (inter, between). In statistical terms, this implies a low variance within a cluster and a high variance between clusters. Group variation explained most of the total data variance, as the clusters differed from the ideal cluster. Thus, cluster analysis aims to maximize the variance ratio between groups (between) over the total variance of the data. This ratio represents the percentage of data variation that the proposed model explains.

3.5. Post-Processing

Once the clusters are estimated, the post-processing stage analyzes the distribution of companies in the clusters. To identify the shared characteristics between companies in the same cluster, the coordinates of the centroids of each cluster were analyzed for each maturity determinant of the inter-organizational networks. This analysis sought to understand the distribution patterns of centroid values.

We then assessed the probability of leaving the network in each cluster and searched for the common factors that predicted this variable. This involved evaluating the level of satisfaction in each cluster, showing a direct correspondence between high levels of organizational and relational perception and member firms' satisfaction and an indirect correspondence with the probability of leaving the SN.

4. Results and Discussion

The results below summarize the 338 responses to the survey developed by [Wegner et al. \(2015\)](#). The firms participated in a set of 19 different networks, with an adequate distribution of respondents among each network, and no network represented more than 10% of the total respondents. Fair distribution of respondents enables the results to be generalizable to the entire set. There was no bias arising from a particular network that contained many respondents.

The profiles of the respondents showed that more than 55% had completed higher or postgraduate education, thus dealing with a sample of people who qualified for the research. Sixty percent did not hold management positions, and 40% held positions of directors, board members, or presidents. The presence of people in the sample with and without a position in the network is essential to avoid vision biases, as management and members' perceptions of the network are often different ([Ferreira and Armagan 2011](#)).

Regarding the year the respondents' companies joined the network, 80% joined before 2012 (see Figure 1). This pattern ensures that the sample comprises respondents who have been associated with and know about the network for a few years.

Finally, considering the number of employees, Table 2 shows that the sample predominantly comprises small companies with fewer than 40 employees. This profile is expected since association in strategic networks is a more important strategy for small companies ([Braga et al. 2022](#)). Therefore, the sample was diverse and competent in evaluating the life cycle of the network in which they were members.

After extracting factorial scores, a hierarchical grouping technique was used to estimate the number of clusters suitable for the study. Using the jump methodology proposed by [Fávero and Belfiore \(2017\)](#), the cutoff point was defined at a height of 50, corresponding to a larger leap in the clusters. Four perpendicular lines meet this cutoff line, establishing four clusters for the studied data.

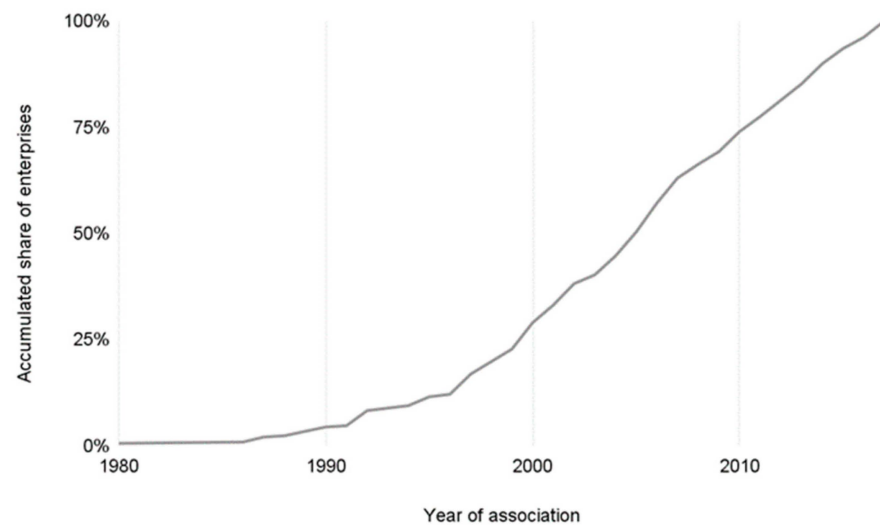


Figure 1. Accumulated distribution of companies by the year they joined the network.

Table 2. Distribution of companies by number of employees.

Number of Employees	Share of Total
1–10	32%
11–20	37%
21–40	22%
40+	9%
Total	100%

The next step is to distribute the companies in the four clusters according to the scores obtained for the network life cycle model factors. The ratio between the explained variance between groups and the total data variance is 74.2%, representing a good fit. The 338 companies were grouped according to the following distribution: 69 in Cluster 1 (20%), 97 in Cluster 2 (29%), 68 in Cluster 3 (20%), and 104 in Cluster 4 (31%).

In descending order of the factor score values, the clusters were organized in the following order: 1, 2, 4, and 3. Table 3 shows that clusters 1 and 2 present positive values, and clusters 3 and 4 present negative values for all life cycle factors. Considering that the factor scores represent the values of the variables that make up each factor (Hair 2009), a higher factor score indicates that the responses to the factor items are mainly distributed in high categories 4 and 5 (partially agree and strongly agree), and lower factorial scores correspond to answers mainly in low categories 1 and 2 (completely disagree and partially disagree).

Table 3. Analysis of some variables for the four clusters.

Variables	Clusters			
	1	2	4	3
Average centroid	0.63	0.21	−0.20	−0.63
Instances numbers	69	97	104	68
Probability of leaving network = 0%	92%	85%	68%	50%
Probability of leaving network = 50%	0%	2%	8%	21%

As the items of the applied survey are positive, high factorial scores in all factors correspond to a better perception of the company about the network to which it belongs and consequently suggest a higher level of network maturity in the life cycle of SNs. In this way, we can label the clusters based on the level of the perception of organizational and

relational aspects of the SN: cluster 1 with a Very high perception cluster, cluster 2 with a High perception, cluster 4 with a Low perception, and cluster 3 with a Very Low perception cluster. Cluster 1 could be designated “The Visionary”. It represents the group with a very high perception, seeing the full potential of organizational and relational aspects of the SN. Cluster 2 corresponds to “The Optimist”. This group has a high perception, maintaining a positive and hopeful view of the SN aspects. Cluster 3 aggregates “The Pragmatist”. This group, with a low perception, sees the SN aspects as they are, without rose-colored glasses. Cluster 4 regroups “The Skeptic”. This cluster has a very low perception, questioning the effectiveness of the SN’s organizational and relational aspects.

In Figure 2, the Visionary cluster (in red) shows the highest values for all factors in the model; the companies within it better perceive their network. It is one of the smallest clusters regarding the number of companies (69) and the cluster in which the companies are closest and most homogeneous (smallest cluster size).



Figure 2. Graphical representation of the four clusters.

The Pragmatist and Skeptic clusters (purple and blue) had the lowest values for all model factors and the lowest centroid values. The characteristics of the two clusters are a more elongated format on the y-axis and a significant number of companies outside the perimeter. This is characteristic of clusters with less homogeneity and smaller intra-cluster relationships.

Regarding the probability of leaving SNs in the next year, 93% of the companies answered that the chance was zero in the Visionary cluster. In addition, when asked about “their satisfaction with the network”, 80% responded that they were very satisfied with the three items that measured their satisfaction (responses focused on option 5: I completely agree).

Instead, in the Skeptic cluster (blue), the percentage of companies that indicated a chance of leaving SNs in the next year increased to 50%, and 21% of them attested that the chance was at least 50%. Regarding the three questions about satisfaction, in the one that measures the perceived benefits of participation, 41% of the answers were allocated

to option 3 (neither agree nor disagree), followed by 34% allocated to option 2 (partially disagree). In the item that assesses overall satisfaction and perception about members' participation in SN activities, the responses were mainly allocated to options 3 and 4 (partially agree).

These results demonstrate that when members have a high perception of the SN's organizational and relational aspects, they tend to have greater satisfaction with their SN and a smaller chance of leaving the network in the following year. On the other hand, lower perceptions are linked to lower satisfaction with the network and an increased chance of quitting.

Also, with an analysis of the format and density of the clusters, it can be inferred that satisfaction with the network is directly related to greater homogeneity in members' perceptions, as the Visionary cluster is small and homogeneous, while the Skeptic cluster is a larger one. This finding corroborates the findings of [Alimadadi et al. \(2019\)](#), who found that misalignment between members is one of the causes of the need to rebuild a network, as this misalignment results in the loss of representativeness of the network.

[Tunisini and Marchiori \(2020\)](#) argued that three pathologies could cause three-level network failures. The pathology at the company level occurs when the company faces individual problems of costs, competitiveness, and innovation and tends to reduce its participation in the SN. This is related to the difficulty of observing the results when working with the network and the misalignment between the individual strategies of the network. Our results confirm this theoretical approach because companies which are dissatisfied with the network benefits or do not feel that their results justify that the costs of being part of the network are concentrated in clusters with lower perceptions about the network and have a greater tendency to leave the group.

Table 4 shows the average factors for each cluster for the main theoretical dimensions under study: Organizational and Relational. In the Visionary cluster, where companies are highly satisfied, both dimensions have high scores, and there is little difference between them. This result strengthens the use of these two dimensions to evaluate the evolution of inter-organizational networks.

Table 4. Average scores for the organizational and relational dimensions of the four clusters.

Dimension	Clusters			
	Visionary	Optimist	Pragmatist	Skeptic
Organizational (O)	4.60	3.07	2.12	3.91
Relational (R)	4.65	3.60	2.54	4.12
Delta (R/O)	1%	18%	20%	5%

The second level of pathology is the intra-network, marked by increased competition and opportunistic behavior among members ([Tunisini and Marchiori 2020](#)). [Wegner et al. \(2018\)](#) showed that the level of participation in activities and meetings and the level of information exchange are critical factors in the failure of networks. When these become points of concern among members, there is a loss of legitimacy in the decisions taken and a consequent decrease in interest in participating in the actions, leading to failure ([Wegner et al. 2018](#)). [Begnini et al. \(2022\)](#) argue that member firms with higher participation see more results in growth, new partnerships, innovation, and increased productivity.

In the clustering results, companies with a better perception of the relational dimension were grouped into the Visionary cluster (Table 4), corroborating the literature findings. [Alimadadi et al. \(2019\)](#) argued that, in the restructuring phase of a network that tends to dissolve, the role of each individual in putting their capabilities in favor of the network and contributing to the reconstruction of internal relationships is crucial.

Finally, the third level of pathology for failure is at the network level, marked by structural problems, such as unbalanced power and a high number of participants, and governance problems, such as a lack of competence of the leader to coordinate the ac-

tivities necessary to achieve the network's objectives (Tunisini and Marchiori 2020). The organizational dimension captures this level of pathology.

In the Skeptic cluster with the lowest centroid and lowest satisfaction of companies with the networks, there is a more significant discrepancy between the results of the two dimensions, following the pattern of the other clusters of the organizational dimension having lower scores, as presented in Table 4.

The results show that the organizational aspects of the network have a more significant impact on member firms' dissatisfaction than the relational aspects. Thus, attention to pathology at the network level is critical to the sustainability of inter-organizational networks.

5. Conclusions

The results of this study provide a deeper understanding of which elements determine the maturity of an inter-organizational network, which are related to the satisfaction of member companies and their tendency to leave the SN. This study makes several contributions to SN theory and practice. First, the analysis of clusters shows that well-grouped and homogeneous clusters relate to companies that are more satisfied with their participation in the network. Joint perception and alignment among members are essential for analyzing the perpetuity of a SN. This result directly contributes to the empirical validation of the life cycle model by Wegner et al. (2015) and, therefore, offers a relevant contribution to the field of studies of SNs and critical success factors of these networks (Wegner et al. 2022).

Second, a positive relationship exists between the scores of the model factors and satisfaction with the network. If a member observes the development of the network in its organizational and relational aspects, they are more satisfied with it. Thus, it is proven that the development of the network towards higher stages of the life cycle influences member firms' satisfaction. This result offers a significant managerial contribution, as it signals to managers of SNs and organizational consultants the need to focus on networks' organizational and relational aspects.

Third, the research also demonstrates the importance of the organizational aspects of the network for its success because, in clusters of companies unsatisfied with the networks, this aspect has a more negative impact than the relational aspects. Thus, organizations should focus on restructuring the network lifecycle to develop and improve management, governance, and meetings. Relationships evolve and progress after organizational improvement.

This study has some limitations. It was conducted in a restricted group of networks in a single industrial sector in Brazil. Networks of companies from different sectors are organized differently and have specific goals regarding their actuation. The context of SNs in Brazil differs from that of SNs in developed countries, which have more mature networks and robust institutional environments. Based on these findings, future studies should include multiple sectors and conduct international comparisons.

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Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. All items for organizational and relational dimensions of strategic networks.

ORGANIZATIONAL DIMENSIONS
Decision-making processes 1. Our strategic network has a clear process for making strategic decisions (those that affect the future of the strategic network in the coming years). 2. Members have the possibility of participating in the strategic network's strategic decision-making (those that affect the future of the strategic network in the coming years). 3. In our strategic network, strategic decisions are made quickly and put into practice at the necessary speed.
Formalization 4. The rights and duties of network members are sufficiently detailed in our strategic network's documents and regulations. 5. The documents that regulate the activities of our strategic network are known to members. 6. When new rules or procedures are created in the strategic network, they are formalized in documents and regulations.
Incentives and sanctions 7. Our strategic network has an appropriate rewards system for members who follow the established rules. 8. Our strategic network applies appropriate punishments to members who do not comply with the established rules. 9. The rewards and punishments established by our strategic network are absolutely clear to everyone.
Control 10. Our strategic network has ways to control whether members are complying with all established rules. 11. The ethical behavior of members in their relationships with other businesspeople and suppliers is observed in our strategic network. 12. Our strategic network controls are used to reward members or punish those who break the rules.
Management structure 13. The strategic network has managers (network members or hired executives) with sufficient time dedicated to managing the strategic network. 14. The physical and human management structure of the strategic network is sufficient for the group's needs. 15. Our management teams can handle all the needs to move the strategic network forward.
Strategy 16. Our strategic network has a clearly defined strategy. 17. Network managers think about strategic issues (which affect the future of the strategic network in the coming years). 18. The network's members are aligned with the strategy that the strategic network has defined.
Administrative procedures 19. The strategic network has well-defined marketing processes. 20. The strategic network's internal communication processes work properly. 21. The strategic network has well-defined negotiation and purchasing processes. 22. The strategic network has clear procedures for accepting new members.
Services 23. The strategic network continually seeks to offer new services to members, aiming to increase the competitiveness of member firms. 24. The services offered by the strategic network meet the needs of my firm. 25. The services offered by the strategic network to members are considered valuable and indispensable by them.
Exchange of information 26. There is a high level of information exchange between network members (about management, suppliers, customers, competitors, strategies). 27. The network office (or equivalent) provides valuable information to participating members. 28. In general, the information circulating in the strategic network is of great importance for the competitiveness of firms.
RELATIONAL DIMENSIONS
Trust in network members 29. I trust the technical and managerial competence of the network's members. 30. I trust the integrity of the network's members. 31. I trust that network members share all relevant information that they have.

Table A1. Cont.

RELATIONAL DIMENSIONS**Trust in network managers**

32. I trust in the technical and managerial competence of the executives who manage the strategic network.
33. I trust the integrity of the executives who manage the strategic network.
34. I trust that the executives who manage the strategic network share all the relevant information that they have.

Leadership

35. There are active leaders on the strategic network's board of directors who lead the strategic network's development.
36. The strategic network encourages the development of new leaders who can lead it in the future (lead teams, tasks, and projects or take on positions on the board).
37. The strategic network's leaders seek to share power and encourage everyone's participation.

Commitment and participation

38. There is a high level of participation by network members in activities (in-person or virtual) developed by the strategic network (events, meetings, courses . . .).
39. Members demonstrate a high level of commitment to the actions carried out by the strategic network (joint purchases, shared marketing, training, etc.).
40. There is a high level of adherence among members to the collective strategies proposed by the strategic network.

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