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KNOWLEDGE NETWORKS, SOLIDARITY, AND ENTREPRENEURSHIP: TOWARDS A THEORETICAL-EMPIRICAL FRAMEWORK

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ABSTRACT

A knowledge network is defined as a form of social interaction designed to complement and enhance the benefits derived from the exchange of knowledge. In this regard, entrepreneurship can illustrate how these network structures influence the success or failure of a nascent business. The aim of this study is to analyze how knowledge networks, grounded in trust and solidarity, impact entrepreneurial activity by fostering synergies that promote innovation and employment. To this end, the theoretical-conceptual model called Knowledge Networks Based on Solidarity in Entrepreneurship is proposed. The research adopts a qualitative methodology based on the case study method, focusing on Company M, located in Toluca, State of Mexico, which specializes in the commercialization of construction tools and moldings. The selection of this profit-oriented company allows for the examination of whether entrepreneurial actions are solely motivated by profit maximization or, on the contrary, encompass the formation of knowledge networks characterized by trust and solidarity. A limitation lies in the very nature of the case study, which leads to context-specific findings that are not generalizable. However, the results validate the proposed theoretical-empirical framework, as the analysis reveals a positive correlation between solidarity and knowledge networks within the entrepreneurial domain.

Keywords: Entrepreneurship, knowledge networks, trust, solidarity.

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Redes de conocimiento, solidaridad y emprendimiento: hacia un marco teórico-empírico

RESUMEN

Una red de conocimiento define una forma de interacción social diseñada para complementar y potenciar los beneficios derivados del intercambio de saberes. En este sentido, el emprendimiento puede ilustrar cómo estas estructuras reticulares influyen en el éxito o fracaso de un naciente negocio. El objetivo de este estudio versa en analizar cómo las redes de conocimiento, basadas en la confianza y la solidaridad, inciden en la actividad emprendedora al fomentar sinergias que promuevan la innovación y el empleo. Para tal efecto, se propone el modelo teórico-conceptual denominado Redes de conocimiento basadas en la solidaridad para el emprendimiento. La investigación adopta una metodología cualitativa basada en el método de estudio de caso, centrada en la Empresa M, ubicada en Toluca, Estado de México, dedicada a la comercialización de herramientas y molduras para la construcción. La selección de esta empresa orientada al lucro permite examinar si las acciones emprendedoras están motivadas únicamente por la maximización de ganancias o, por el contrario, abarcan la formación de redes de conocimiento caracterizadas por la confianza y la solidaridad. Una limitación radica en la propia naturaleza del estudio de caso que arroja hallazgos específicos del contexto y no generalizables. No obstante, los resultados validan el marco teórico-empírico propuesto, ya que el análisis revela una correlación positiva entre la solidaridad y las redes de conocimiento dentro del ámbito emprendedor.

Palabras clave: Emprendimiento, redes de conocimiento, confianza, solidaridad.

Introductıon

The significance of knowledge networks lies in their capacity to offer a comprehensive perspective on the potential of individuals operating within institutional frameworks. In such environments, innovation often transcends the confines of traditional corporate research and development laboratories, emerging instead as the product of shared and socialized knowledge. A knowledge network can be defined as a structured form of social interaction designed to complement and magnify the benefits arising from the sharing, exchange, and transfer of knowledge. These networks are uniquely characterized by relationships founded on solidarity, cooperation, and trust.

Although a universally generalizable framework capturing the intricacies of these reticular structures has yet to be established, three core dimensions can be discerned: institutional, morphological, and structural.

The institutional dimension defines the operational context of a knowledge network, highlighting the interaction between formal and informal institutions. Formal institutions are represented by codified rules, guidelines, and regulations, whereas informal institutions are expressed through cultural heritage, ethical values, and social norms. The morphological dimension pertains to the hierarchical configuration of the network, where an ideal knowledge network assumes a horizontal structure that promotes equitable participation and collaboration. Meanwhile, the structural dimension focuses on the evolution and resilience of the network's connections, emphasizing the central role of trust in fostering reticular solidarity.

Entrepreneurship exemplifies how knowledge networks operate within the context of new business creation, driving innovation and generating employment. Beyond profit motives, these networks reveal interactions rooted in trust and solidarity.

The aim of this study is to examine the extent to which knowledge networks, grounded in trust and solidarity, impact entrepreneurship by fostering synergies that promote innovation and employment.

In order to examine the relationship between knowledge networks, solidarity, and entrepreneurship, a conceptual theoretical framework entitled *Knowledge Networks Based on Solidarity in Entrepreneurship* has been developed, with the objective of identifying the pertinent analytical categories. The application of the qualitative case study method is recommended to determine the existence of a connection and to investigate how solidarity and network structures emerge and consolidate within the entrepreneurial context.

The enterprise selected for this study, hereafter referred to as *Enterprise M* to maintain confidentiality, is located in Toluca, Mexico, and specializes in the commercialization of construction tools and moldings. The selection of a profit-oriented business enables the observation of whether entrepreneurs adopt behaviors driven solely by the pursuit of profit, or, alternatively, whether they establish knowledge networks founded on trust and collaboration. The findings support the viability of the empirical theoretical framework, suggesting a positive relationship between solidarity and the formation of knowledge networks within the entrepreneurial context.

Knowledge networks and solidarity

In response to the profound and rapid transformations within productive and organizational systems, driven by globalization, dynamic shifts in demand, the pervasive integration of artificial intelligence, and the incorporation of economies into environments defined by Industry 4.0, the formation of networks among agents of diverse nature has become increasingly prominent. These networks facilitate the exchange of both material and human resources, thereby fostering the dissemination of knowledge that is essential for innovation and economic growth (Canales & Montiel, 2023; Canales, 2023).

While determining the exact origin of network analysis within the economic framework remains imprecise, studies on innovation systems (Lundvall, 2010; Johnson, 2010) present foundational perspectives on the critical importance of establishing linkages with the surrounding environment. Such linkages contribute to the formation of a social and economic interactive system, wherein companies, universities, and governments engage in collaborative efforts to complement, modify, and disseminate new knowledge, technology, and innovation (Canales & Montiel, 2023).

In this context, the knowledge networks perspective offers a framework that not only facilitates the observation of network connections formed within companies but also the links they establish with other sectors, such as government, academia, and society (Ferrer et al., 2022). Unlike innovation networks, which are primarily concerned with the generation of new products and processes, knowledge network structures encompass a broader concept, wherein the creativity of individuals embedded within an institutional environment serves as the central axis for collective learning and the absorption of new knowledge, ultimately aimed at addressing social and economic challenges (Bedford & Sánchez, 2021; Ritala et al., 2023).

A knowledge network is defined as a form of social interaction established with the aim of complementing and enhancing the benefits derived from the sharing, exchange, and transfer of knowledge, wherein relationships founded on solidarity, cooperation, and trust are particularly prominent (Yang et al., 2020). While a universally applicable understanding of the inherent particularities of knowledge networks remains elusive, it can be inferred that such networks are systemic structures, influenced by institutional, morphological, and structural dimensions (Canales & Montiel, 2023).

The institutional dimension refers to the environment defined by institutions, understood as the rules that regulate the behavior of individuals interacting within society. According to their nature, these institutions are categorized into formal and informal (Wang et al., 2018; Canales, 2023). The former, which are explicit in nature, are embodied in norms, regulations, and guidelines recorded in written documents, while the latter are distinguished by their implicit nature, reflected in cultural values and ethical codes that influence knowledge generation. Together, formal and informal institutions determine the framework within which networks develop, establishing their durability and evolution over time (Wang et al., 2018).

The morphological dimension refers to the horizontal or vertical arrangement of the actors involved in the network. In the realm of knowledge, a horizontal structure represents the ideal situation for the exchange of knowledge, as it fosters communication, trust, solidarity, and the flow of resources, with no central actor. In contrast, a vertical network exhibits a hierarchical arrangement, where a central agent dictates how the other members of the network interact (Canales, 2018; Canales & Montiel, 2023).

The structural dimension defines the dynamic nature of the network, necessitating the evolution and sustainability of its connections. The primary focus is on the imperative of knowledge exchange, with the establishment of trust being paramount, which, in turn, influences network solidarity (Bixler, 2021).

In a knowledge network, trust assumes a fundamental role in delineating ethical frameworks and behavioral norms, which are predicated upon positive expectations of counterparts (Wang et al., 2018). Within this context, three categories are identified: personal, technical, and motivational.

Personal self-confidence refers to the belief in one's own abilities, grounded in socially constructed norms, values, and beliefs. Technical confidence pertains to the skills, reputation, and prestige associated with an individual's competence in performing specific tasks. Meanwhile, motivational trust encompasses commitment, responsibility, social solidarity, and the calculation of mutual gains (Dormandy, 2020; DeVries, 2021).

While the establishment of long-term trust in a knowledge-based network is desirable, limitations arise. First, the possibility exists that one party may act fraudulently under external pressures. Second, prolonged relationships may foster excessive trust, which can inhibit cognitive novelty (Montiel et al., 2022).

In these adverse situations, solidarity assumes significant importance, requiring unified attitudes focused on achieving common goals and interests that foster the creation of new knowledge. Within a knowledge network, relationships rooted in solidarity complement the structural dimension by promoting empathy and mutual support, both of which are essential for developing new skills and experiences (Bianchi et al., 2020).

To this end, mechanical solidarity is defined by the connection, cohesion, and integration arising from homogeneity in aspects such as education, religion, or lifestyle. It is predominantly observed in networks composed of individuals who share similar behaviors or ways of thinking, as seen in familial or friendship-based structures. In contrast, organic or consensus solidarity emerges from the application of specialized knowledge to address complex problems. This dynamic promotes interdependence, as individual cognitive abilities, when combined through interaction, generate complementarities of knowledge that drive collective progress (Karam, 2020).

In general, knowledge networks are intricate structures akin to living organisms, where interactions generate dynamic connections between individuals. Each participant contributes unique experiences, skills, and knowledge, with the continued evolution and survival of the system relying on the institutional, morphological, and structural contexts. Entrepreneurship illustrates how these networks operate in the creation of new businesses, where, beyond the pursuit of profit, empathy and solidarity play a central role.

Entrepreneurship: Micro-Psychological, Meso-Sociological, Macro-Institutional, and Social Angles

In the context of economic theory, the figure of the entrepreneur stands as a central axis within the business realm. Through their innovative ideas, entrepreneurs have a positive influence on the creation of businesses and the promotion of innovation. Etymologically, the term *entrepreneurship* is derived from the Latin *in prendere*, meaning "to take possession of something," a term initially used in reference to soldiers and adventurers. In the business world, it is associated with the French word *entrepreneur*, which means "pioneer" and refers to individuals who engage in business activities based on innovative ideas (González et al., 2019).

Historically, research on entrepreneurial activity traces back to the pioneering work of Richard Cantillon, a prominent figure in the 17th-century Physiocratic School. Cantillon was the first to introduce the term "entrepreneur" to describe an individual who is distinguishable from others by their specialized skills in recognizing profit opportunities through the acquisition of means of production, and subsequently generating products that stimulate the economic system through the circulation and exchange of goods. Unlike other businessmen, the entrepreneur operates within an environment marked by uncertainty and market risks; the absence of risk aversion being a central defining characteristic of entrepreneurship (Terán & Guerrero, 2020; Ávila, 2021).

At the beginning of the 20th century, Schumpeter's proposal complemented this vision by explicitly incorporating the importance of the entrepreneur in the realms of innovation and economic development. Schumpeter designates the entrepreneur as a creative individual, immersed in an environment of uncertainty and risk, whose ideas infuse dynamism into the economic system through the processes of creative destruction and the business cycle (Schumpeter, 1942; Fernandes & Mueller, 2019).

Creative destruction originates from the cognitive capacity of the entrepreneur, where ideas act as the starting point for innovation. The introduction of novel concepts leads to the development of new production frameworks that replace obsolete patterns, while simultaneously fostering the emergence of a business cycle. This process commences when innovation enters the market, which subsequently gives rise to depressive or crisis phases that ultimately culminate

in adaptation to the new production arrangements. Phases of growth or expansion result from the adjustment and proliferation of innovative activities (Schumpeter, 1942; Robra et al., 2023).

The significance of the Schumpeterian perspective is twofold. First, it represents a pioneering approach to the analysis of entrepreneurship, and second, it positions the entrepreneur at the heart of national development. Entrepreneurs, driven by creativity, ideas, and a willingness to embrace risk, are constantly engaged in the pursuit of innovation. This quest enables them to secure exceptional profits and temporary monopolistic advantages, which, in turn, contribute to the ongoing transformation of the economic system (Fernandes & Mueller, 2019).

Since the mid-20th century, a range of analytical frameworks has significantly expanded the traditional economic interpretation of entrepreneurial activity. Within this expanded scope, three primary perspectives have emerged: psychological, sociological, and business management (Terán y Guerrero, 2020). These paradigms offer a more sophisticated understanding of the entrepreneur's multifaceted nature and the dynamic interactions between the individual and their environment.

The psychological perspective accentuates the key personality traits and behaviors that define the entrepreneurial individual. Within this framework, seminal theories such as Positive Psychology (Seligman, 2002) and Locus of Control (Rotter, 1954) have profoundly shaped our understanding of entrepreneurial motivation and behavior. These theories are essential for elucidating the psychological foundations of entrepreneurship, shedding light on how entrepreneurs cultivate resilience, immerse themselves in their endeavors, and exercise agency in environments rife with uncertainty; elements that are critical to fostering both innovation and business success.

The sociological perspective on entrepreneurship underscores the learning processes that arise through interactions among individuals. Through these social connections, entrepreneurs cultivate essential skills, acquire valuable knowledge, and establish networks that enhance their capacity to identify opportunities and navigate challenges. Moreover, it facilitates the creation of a collaborative environment that fosters both innovation and business growth. In this context, Social Learning Theory (Bandura, 1977) serves as a pivotal framework for understanding how knowledge is shared and applied within entrepreneurial settings.

The business management perspective can be exemplified through the concept of the entrepreneurial ecosystem (Isenberg, 2011) and Economic Institutionalism (North, 1990), wherein the establishment of institutional connections between the entrepreneur and their broader environment assumes paramount importance. This dynamic interaction serves as a catalyst for generating collaborative synergies that, in turn, facilitate the creation of employment opportunities, the development of businesses, and the promotion of innovation. Such an ecosystem underscores the necessity of nurturing networks and linkages that provide access to essential resources, knowledge, and opportunities, elements crucial for the sustenance and expansion of entrepreneurial ventures. By cultivating these institutional ties, entrepreneurs are better positioned to navigate the complexities of the market, thereby contributing to the creation of more resilient and prosperous economic landscapes (Canales, 2023).

Thus, building upon the preceding theoretical frameworks, it is plausible to propose three analytical levels for observing entrepreneurial activity from a systemic perspective: micro-psychological, meso-sociological, macro-institutional and social.

In the micro-psychological environment, Positive Psychology (Seligman, 2002) focuses on the positive aspects of human existence, such as happiness, well-being, and optimism. This approach explores how individuals can lead a fulfilling and meaningful life by developing strengths like resilience and motivation.

In the entrepreneurial context, establishing a business not only fosters personal well-being and satisfaction, but also necessitates the cultivation of resilience to overcome adversity. Moreover, it is essential for the entrepreneur to maintain an optimistic perspective and sustained motivation toward achieving long-term goals, along with a visionary outlook on the business's future (Nunez et al., 2020). This perspective is grounded in the conviction that psychological well-being plays a pivotal role in entrepreneurial success, as it enables entrepreneurs to navigate challenges and persist in their pursuit of objectives (Hasan et al., 2019; Hartmann et al., 2023).

The Locus of Control theory (Rotter, 1954) posits that individuals interpret events in their lives either as the result of their own actions (internal locus) or as influenced by external factors beyond their control (external locus). Those with an internal locus of control believe that their personal choices, actions, and capabilities directly shape the outcomes they experience. In contrast, individuals with an external locus of control are more inclined to attribute their successes or failures to external forces, such as luck or fate (Hamzah & Othman, 2023).

In the entrepreneurial context, individuals with an internal locus of control often perceive the success of their ventures as being determined by their decisions, leadership skills, knowledge, and experience. On the other hand, entrepreneurs with an external locus of control frequently attribute business outcomes to forces beyond their direct influence. Such external attributions may hinder their ability to effectively confront adversity and limit their capacity to generate innovative strategies (Arkorful & Hilton, 2022).

Regarding the meso-sociological domain, Social Learning Theory (Bandura, 1977) argues that learning arises from observation and interaction. Individuals acquire behaviors, attitudes, and skills through observing and imitating the actions of others. In the entrepreneurial context, social learning elucidates how entrepreneurs learn and adapt through their interactions with the environment (Querejazu, 2020). By engaging with others, they acquire knowledge, beliefs, and attitudes, creating a feedback loop between personal, behavioral, and environmental factors. This socialization mechanism influences entrepreneurs by fostering the acquisition of new experiences, skills, and capabilities essential for effective resource management in their businesses (Norton & Gino, 2020; Lattacher et al., 2021).

In the macro-institutional context, the Entrepreneurial Ecosystem (Isenberg, 2011) refers to the network of heterogeneous actors who, through feedback loops, establish the conditions necessary for the creation, development, and sustainable growth of new businesses (Theodoraki et al., 2023). Its purpose is to generate network structures that foster synergies among political, academic, business, cultural, and social actors, with connections being non-linear and dynamic in nature. From this perspective, relationships based on trust and collaboration are of primary importance, as they facilitate the exchange of both physical and cognitive resources within and beyond the nascent company (Pita et al., 2021).

At the same time, Economic Institutionalism (North 1990) emphasizes the institutional role that shapes the evolution and economic development of societies. Within this framework, institutions represent more than just a geographically confined physical space; they encompass intangible elements such as language, cultural heritage, and ethical values (Montiel et al., 2022;

Canales, 2023). Formal institutions are characterized by their tangibility, manifested in written documents such as rules, regulations, and guidelines, whereas informal institutions are distinguished by their intangible nature, transmitted through social interaction and reflected in customs, codes of conduct, and cultural heritage.

The economic performance arising from the interaction between formal and informal institutions concurrently determines the creation of jobs, innovation, and national development (Camargo et al., 2018). In the entrepreneurial context, institutions constitute the network of links between formal and informal structures, which ultimately influence the success or failure of nascent companies.

In conclusion, the common thread among the perspectives discussed lies in the creation of businesses centered on innovation and profit generation. However, this viewpoint overlooks the existence of organizations whose primary mission is to address social challenges, where the pursuit of profit takes a secondary role to the achievement of social impact.

Social entrepreneurship represents a distinctive approach, diverging from models focused on the pursuit of monetary gain. In contrast, the identification of business opportunities within this domain is grounded in the creation of social value, driven by empathy and altruism in addressing societal challenges. Consequently, this form of entrepreneurship is referred to as the fourth sector, as it may arise from initiatives led by traditional entrepreneurs, governmental entities, non-profit organizations, and even civil society (Talukder & Lakner, 2023).

Although a single categorization of the characteristics inherent to social enterprises cannot be established, they are non-profit, self-sustaining entities that generate profits intended for reinvestment, thereby enabling the continuation of their social mission. Additionally, they are characterized by fostering social innovation, which contrasts with traditional perspectives. Rather than focusing on offering innovative products and services, social enterprises aim to propose innovative solutions to address social issues such as poverty, violence, and education, among others (Pfeilstetter & Gómez, 2020).

Additionally, social entrepreneurs possess a high degree of empathy toward the community, have a keen awareness of adverse situations, and demonstrate leadership and motivational capabilities aimed at social transformation. In contrast to traditional businesses, social entrepreneurship must be conceived with the explicit goal of generating social improvements, with economic profits being a secondary consideration (Lambrechts et al., 2020).

Parallel to social entrepreneurship is solidarity entrepreneurship, which shares similar characteristics; however, the key distinction lies in the fact that social value is created through the formation of solidarity-based enterprises.

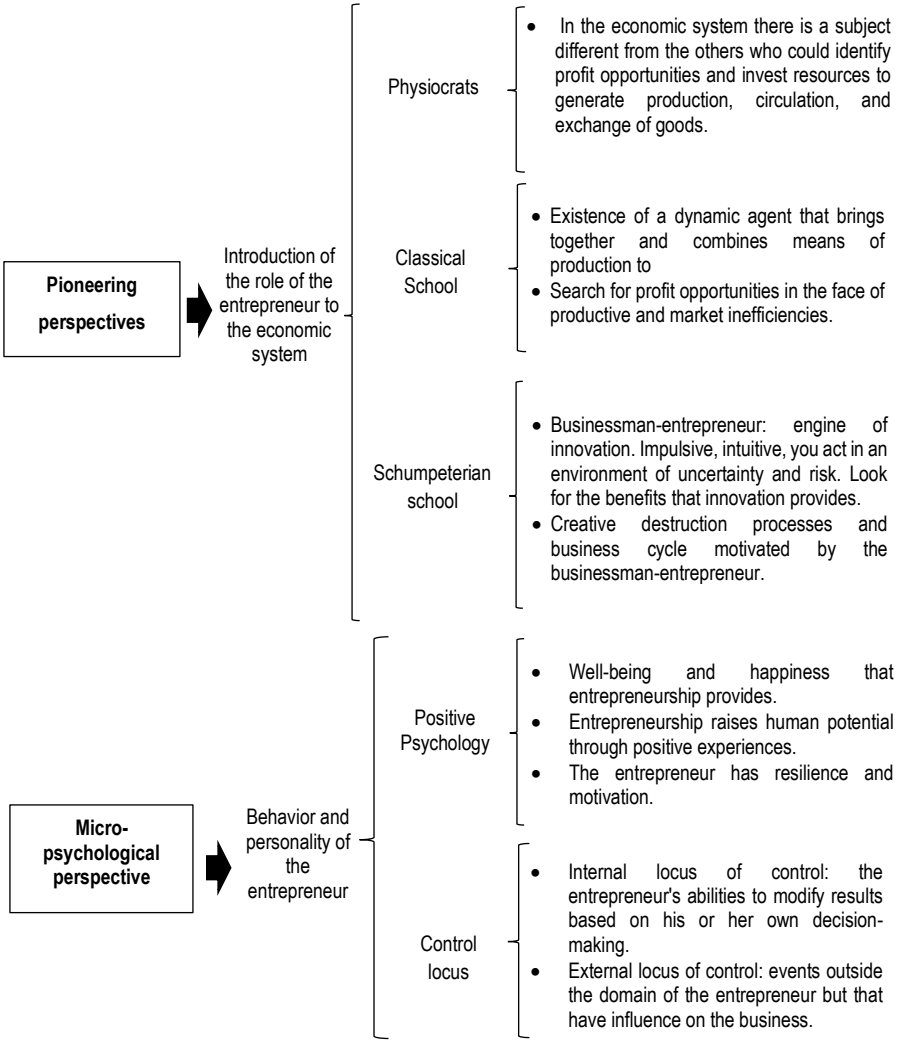
A solidarity company diverges from traditional businesses by being established based on the principles of democratic participation, equal rights among partners and a barely hierarchical collaborative structure. Frequently, they are established to carry out activities grounded on cooperation, mutual help and self-management created on the knowledge and resources of their participants. These tend to be exemplified by structures such as cooperatives, associations, and community enterprises (Bayona et al., 2023).

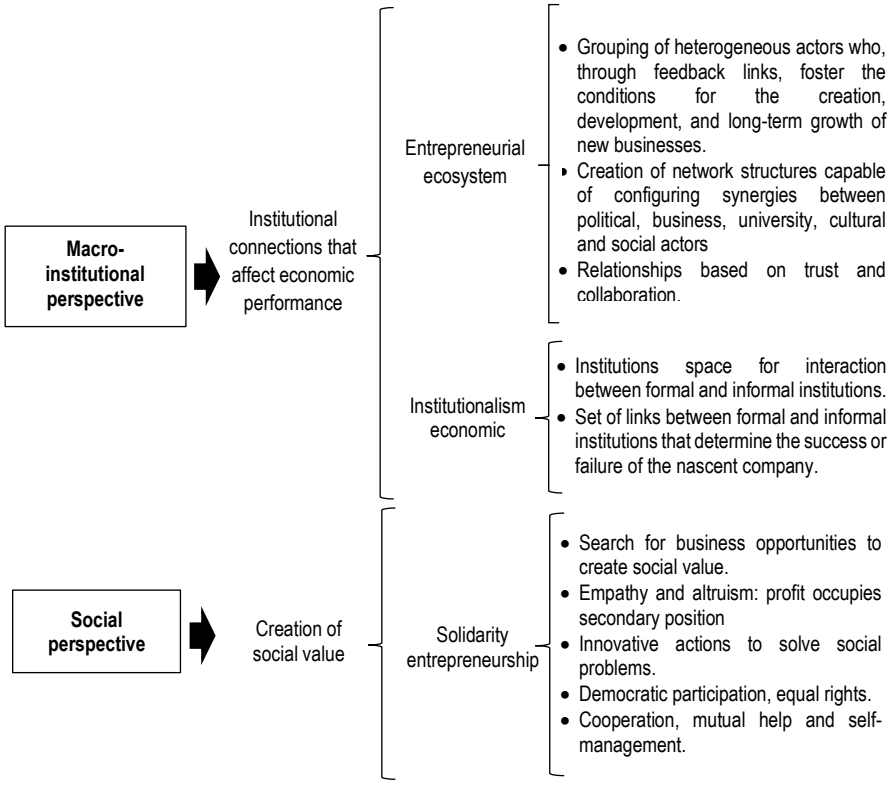
A solidarity-based company differs from traditional businesses in that it is founded on the principles of democratic participation, equal rights among partners, and a minimally hierarchical, collaborative structure. These companies are often established to engage in activities rooted in cooperation, mutual aid, and self-management, drawing on the knowledge and resources of their

participants. Such organizations are typically exemplified by structures like cooperatives, associations, and community enterprises (Bayona et al., 2023).

In general, Figure 1 summarizes the key elements of the theoretical perspectives on entrepreneurship from the micro-psychological, meso-sociological, macro-institutional, and social perspectives.

Figure 1.
Micro-psychological, Meso-sociological and Macro-institutional angles of the entrepreneur





Method and Methodology

The analysis of knowledge networks based on solidarity for entrepreneurship was conducted using a qualitative methodology with a case study approach. First, a theoretical - conceptual framework was developed to identify the *a priori* categories derived from the literature review presented in the preceding sections. Next, a business based in the city of Toluca, Mexico, specializing in the commercialization of construction tools and moldings. This women-managed company will be referred to as Company M. The data collection instruments included three in-depth interviews and non-participant observation, conducted in January 2024. To ensure the validity of the information, the technique of theoretical saturation was employed, which is reached when the collected data no longer provides new insights or aspects to explain the phenomenon (Corbin & Strauss, 2008).

Conceptual Model: A Priori Categories for Knowledge Networks Based on Solidarity in Entrepreneurship

Derived from the literature review, a theoretical-conceptual framework is proposed to identify the *a priori* categories, which emerge from the previous review and are based on the micro-

psychological, meso-sociological, and macro-institutional angles of the entrepreneur. These predetermined categories, established prior to conducting the case study, facilitate the identification of patterns within the qualitative phenomenon (Flick, 2018).

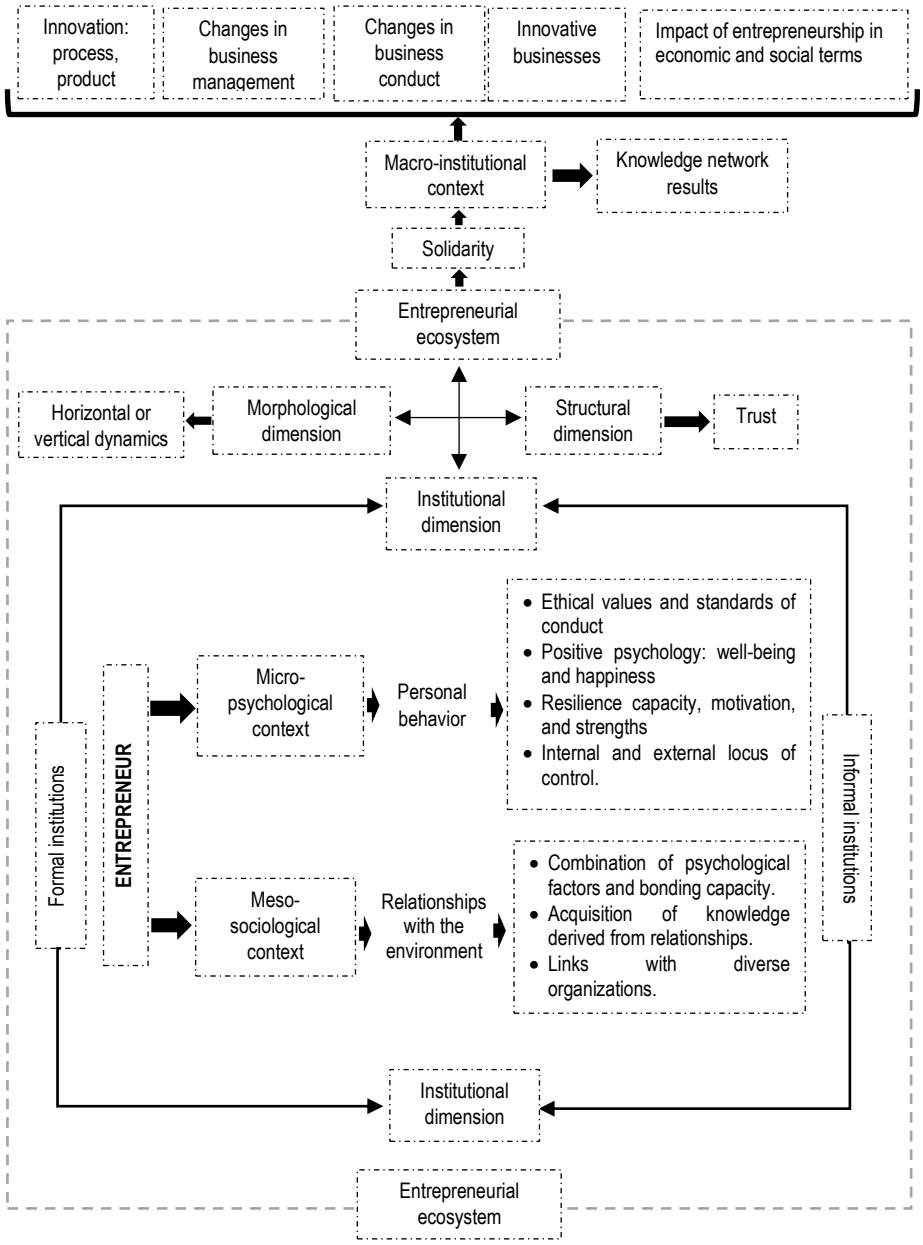
The theoretical-conceptual proposal for the *a priori* categories is presented in Figure 2, which illustrates the conceptual model of Knowledge Networks Based on Solidarity in Entrepreneurship. This model highlights the complex nature of the entrepreneur, characterized by a network of connections to their environment and non-quantifiable particularities that vary according to the institutional context.

The point of convergence between the perspectives of knowledge networks and entrepreneurship is emphasized in the interactions among a group of heterogeneous actors, focused on creating new businesses, fostering innovation, and addressing social issues. As such, the entrepreneur assumes a systemic role in entrepreneurial action, where the pursuit of profit may take a secondary position due to the presence of non-economic behaviors driven by empathy, solidarity, and amicable relationships.

In this regard, the micro-psychological environment of the entrepreneur can be likened to informal institutions, due to its reference to ethical values and standards of conduct, which concurrently influence positive psychology and the external and internal locus of control. These psychological traits foster a sense of belonging, well-being, resilience, and motivation; qualities that enhance the entrepreneur's capacity to withstand environmental challenges.

From a meso-sociological perspective, individual psychological factors are intertwined with the entrepreneur's ability to connect with other social agents. In this context, knowledge assumes a central role, as it facilitates the acquisition of complementary experiences, skills, beliefs, and attitudes.

Figure 2. *Knowledge networks based on solidarity for entrepreneurship: Theoretical-conceptual proposal of a priori categories*



By engaging in an environment shaped by knowledge networks, entrepreneurs foster connections with a variety of organizations, particularly companies, the public sector, universities, and society. Each organization possesses the capacity to absorb, internalize, combine, and externalize knowledge, with the goal of creating innovations that benefit society.

The macro-institutional context of the entrepreneur reflects the outcomes of the knowledge network, which influences the performance of new businesses in terms of innovation, changes in organizational management, shifts in entrepreneurial behavior, and positive societal impact in addressing specific issues. Within this environment, the institutional role involves uniting organizations that share common values, customs, and guidelines.

Entrepreneurial spheres, influenced by psychology, contextual connections, and institutional dynamics, suggest that entrepreneurs create knowledge networks with the aim of maximizing economic gains. However, attributes such as empathy, respect, and altruism foster the emergence of an entrepreneurial model that departs from homo economicus behaviors, emphasizing social benefits over monetary profits.

The morphological and structural dimensions of the network depend on the configuration of the micro-psychological, meso-sociological, and macro-institutional levels, where trust facilitates the construction of frameworks based on solidarity. Solidarity within knowledge networks integrates both formal and informal institutions. The psychology of entrepreneurs externalizes informal institutions rooted in leadership, capabilities, helping others, empathy, and concern for others. Meanwhile, the meso-sociological and macro-institutional contexts define the goals of these relationships, which materialize as either tacit (informal) agreements or explicit (formal) ones. Thus, it can be concluded that solidarity serves as the central link between knowledge networks and entrepreneurial activity.

The theorical model of Knowledge Networks Based on Solidarity in Entrepreneurship suggests that the success or failure of new businesses depends on a holistic system of interconnected relationships. While innovative ideas from entrepreneurs are essential, they alone are not enough to create knowledge networks grounded in solidarity.

Qualitative case study method

To critically assess the elements articulated in the *a priori* theoretical-conceptual framework and, fundamentally, to explore how knowledge networks grounded in solidarity shape entrepreneurship, the qualitative case study method was adopted. This methodology was deemed appropriate, not only due to the lack of statistical data on the subject but also because it allows for a profound examination of the phenomenon, which involves intangible and non-quantifiable dimensions such as trust, capabilities, and empathy.

The qualitative case study method was chosen for its ability to deeply examine a specific phenomenon within its real-life context, prioritizing exploration and understanding over measurement and generalization, characteristics typically associated with quantitative methods. This approach is holistic, as it provides a comprehensive view of the case, encompassing its social, economic, and cultural dimensions (Wünsch & Araujo, 2019). Furthermore, it is contextual, as it unfolds within the environment where the phenomenon occurs, enabling a more profound and detailed understanding (Pinero et al., 2019). Lastly, it is distinguished by its inductive nature, with conclusions emerging directly from the collected data, rather than being derived from pre-established hypotheses (Wünsch & Araujo, 2019).

A notable limitation of this method is its inability to generalize findings, as its primary aim is to comprehend the specific circumstances surrounding the phenomenon under study. However, one of its significant strengths lies in its capacity to facilitate the collection of direct information, owing to the close interaction between the researcher, the phenomenon, and the object of analysis (Pinero et al., 2019).

To empirically verify the conceptual theoretical proposal titled *Knowledge Networks Based on Solidarity in Entrepreneurship*, Enterprise M was selected through purposeful sampling. Characteristics that aligned with the research objectives were identified through observation, including the owners' empathy toward their employees, their ability to cultivate friendships, the trust established with business participants, and their solidarity with family members and other stakeholders within the organization. Although not an initial selection criterion, it was noted that the enterprise is managed by women who share familial ties.

In a similar vein, the proprietors of Enterprise M exhibited a collaborative disposition, granting direct access to information, thereby enabling an in-depth observation of the business operations and its interactions with the surrounding environment. This openness allowed for the acquisition of detailed data regarding the business's history, its entrepreneurial context, and the dynamics of interpersonal relationships within the organization.

The data collection instruments comprised three semi-structured interviews and non-participant observation, conducted in January 2024 with the proprietors of Enterprise M. The semi-structured interview was chosen for its capacity to adhere to a predefined set of questions, while allowing for flexibility to adapt the conversation and pose supplementary questions that could further elucidate or clarify pertinent aspects (Flick, 2021). In parallel, non-participant observation was selected as it enabled the researchers to observe and record the entrepreneurs' interactions with their environment, without direct involvement. This method ensured a more objective examination of the phenomenon, precluding any potential influence or value judgment concerning the behavior of the subjects observed (Maxwell, 2013).

Following the completion of the interviews, the data were processed through initial transcription, supplemented with field notes. Subsequently, an initial coding procedure was undertaken to identify emerging categories. Through the aggregation of similar codes, these categories were further refined, reflecting the critical aspects of the phenomenon under investigation.

Specifically, the emerging categories symbolize concepts, themes, or patterns that arise directly from the data collected empirically, without prior definition or establishment by the researcher. The importance of these categories resides in their capacity to reveal novel aspects of the phenomenon under investigation. Subsequently, a comparative analysis was conducted, wherein the *a priori* categories were contrasted with the emerging ones. This approach enables the juxtaposition of theoretical constructions with the practical realities of entrepreneurship. Subsequently, an analysis was conducted to assess the impact of knowledge networks, rooted in trust and solidarity, on Enterprise M.

Results of Knowledge Networks Based on Solidarity for Entrepreneurship: Case Study

The case study focused on the behavior of Enterprise M, located in the city of Toluca, State of Mexico, which specializes in the commercialization of construction tools and moldings. The

analysis of this business allowed for the examination of how knowledge networks, grounded in solidarity, are formed to generate synergies for business growth.

In this context, it was observed that although the primary objective of the enterprise is profit, behaviors characteristic of *homo sapiens* were evident, where not only monetary gain is valued but also the establishment of relationships characterized by trust, solidarity, empathy, and friendship.

Furthermore, Enterprise M is led by women. One of the leaders possesses specialized expertise in administration, resource management, and strategic planning, having completed postgraduate studies. The other entrepreneur, though trained as a dentist, has accumulated experience in the construction sector and maintains an extensive network of professional contacts.

Initially, the business was jointly managed by a married couple. However, due to unforeseen circumstances, they made the decision to part ways. Despite lacking formal training in business management, the wife opted to continue the venture independently.

Assuming control of the business entailed confronting a series of urgent challenges. Enterprise M was operating at a loss, teetering on the brink of closure due to liquidity shortages, plagued by inefficiencies in inventory management, and burdened with significant pre-existing debts. As Entrepreneur 1 (the wife) expressed: “I had no money, I was overwhelmed with debt, and I had little desire to continue. Yet, I thought of the employees and my children. I couldn’t abandon the business. How could I leave them without work? How could I pay the bills and tuition fees? Although I am a dentist with my own practice, I needed to supplement my income and save the business. I couldn’t give up; I had to summon the strength to carry on” (Entrepreneur 1, personal communication, January 10, 2024).

At the same time, Entrepreneur 2, the sister-in-law of Entrepreneur 1, had long desired to own her own business, but due to professional commitments, she found herself lacking the time to pursue this aspiration: “I have always wanted to start a business, but my job is demanding and not a mere pastime” (Entrepreneur 2, personal communication, January 8, 2024).

In an informal conversation, Entrepreneur 1 confides in Entrepreneur 2 about the challenges she is encountering and inquires whether she knows someone who could potentially serve as a business partner. Entrepreneur 2 offers her assistance, driven not only by her aspiration to establish her own business but also by the familial bond they share. She firmly believes in mutual support, empathy, and solidarity among women, and she places her complete trust in her sister-in-law.

Thus, a cooperative network was consolidated in which, on one hand, the bonds of trust and solidarity among women within the same family were strengthened, and on the other, a synergy was generated that propelled the entrepreneurial endeavor. In this context, Entrepreneur 1 contributed her vast practical experience in business management, an extensive portfolio of clients and suppliers, and the support of a family network that operates as a “cluster of family businesses.” Entrepreneur 2 brought her postgraduate knowledge in business management, along with over 20 years of teaching experience at a public university, where she teaches business-related subjects. Additionally, she possesses the necessary capital to drive the project. The combination of these strengths created an effective and complementary collaborative dynamic, maximizing the business’s chances of success.

Based on the previous description, it is possible to identify a series of characteristics linked to the micro-psychological aspect of female entrepreneurs. These individuals operated within frameworks of positive psychology, demonstrating a remarkable capacity for resilience and motivation that enhanced their strengths. Furthermore, they acted from an internal locus of control, believing that their actions would directly influence the outcomes and success of their businesses.

In the context of the meso-sociological scope shaped by relationships with the environment, the establishment of an enterprise of a systemic nature was particularly noteworthy, underpinned by trust-based relationships among clients, family members, suppliers, and employees.

The clients played a pivotal role in the recovery of the business, becoming a fundamental pillar during critical junctures. In this context, a "cluster of family-owned businesses" was established, as both Entrepreneur 1 and Entrepreneur 2 are members of a family with strong ties to the construction sector. The family support network not only contributed to the management of the business but also facilitated the establishment of new suppliers and clients. Additionally, several family members are consumers of the products offered by the venture, as they are proprietors of construction companies.

This family cluster included a construction company owned by the brother of Entrepreneur 1 and the husband of Entrepreneur 2; a company that sells aluminum products for construction, managed by cousins and uncles; and a materials trading company for construction, also owned by cousins and uncles.

Within this cluster, a process of collective learning was recognized, as family members exchanged knowledge about business opportunities and acted as both clients and suppliers to one another. In collaboration with clients, joint strategies were implemented to address any challenges, such as offering credit on purchases, which encouraged the acquisition of new clients and fostered the long-term growth of the business.

Simultaneously, the enterprise demonstrated a strong commitment to valuing all individuals through the cultivation of a positive work environment and the provision of personalized attention to its clientele. This approach, combined with the offer of credit and previous satisfactory experiences, led clients to recommend Entrepreneurship H to other businesses, thereby facilitating its expansion into new markets.

The friendships with suppliers played a pivotal role in the consolidation of the enterprise. Previous collaborative ties, rooted in trust, provided access to credit, which proved indispensable for the business's reopening. Entrepreneur 1 had a well-established history of interaction with these suppliers, who placed their trust in her capabilities and ethical principles. This confidence facilitated the extension of credit for the procurement of products, thereby revitalizing the enterprise's commercial operations.

As a result of its connections with clients and suppliers, the enterprise identified a distinctive marketing strategy that did not require monetary expenditure on advertising. The family relationships and prior positive interactions with clients and suppliers facilitated the acquisition of new customers, enabling the company to conserve substantial resources while fostering a business environment based on loyalty and cooperation.

Conversely, the links with other spheres, such as the governmental and academic sectors, were infrequent and did not prove indispensable for the operation of the business. The

relationship with the government was limited to adherence to regulations, while with universities, the intent was to establish contact with students to facilitate their community service placements.

In the macro-institutional framework, the institutional dimension of knowledge networks revealed a notable predominance of informal institutions over formal ones. The entrepreneurs established tacit agreements regarding their business partnership, without a written contract, though they intended to formalize the relationship in the future. At the same time, mutual trust with clients, suppliers, and family members served as an informal institution, where the primary focus was not on written agreements, but on collaboration based on trust and ethical values. The parties involved cooperated and exchanged experiences, knowledge, and skills to foster the consolidation of the business. This dynamic also influenced the structural dimension, as it defined a horizontal knowledge network supported by cohesion, solidarity, and trust.

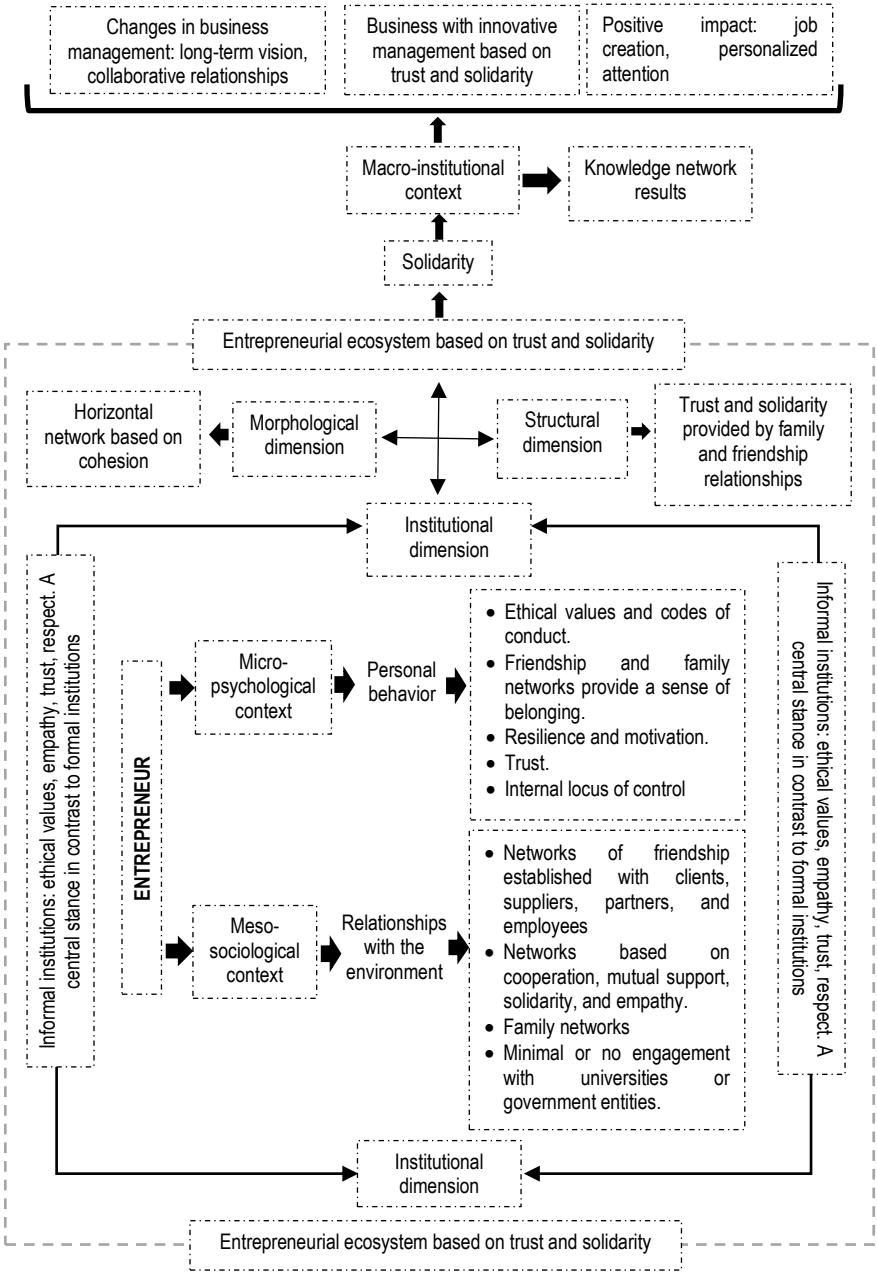
In the view of the businesswomen, solidarity is a broad concept often confused with charity. However, they understand it as the integration of capabilities, collaboration, and mutual support, with trust and empathy serving as essential factors among businesses, workers, clients, and suppliers. They perceive a relationship of mutual benefit between empathy and solidarity and believe that networks of solidarity among women must be strengthened.

Based on this understanding, it can be inferred that solidarity was the central element that unified the entrepreneurial ecosystem of M. These concepts were vital for the long-term, sustainable growth of the enterprise, as they involved the integration of capabilities, collaboration, reciprocal support, and the perception of mutual benefits.

The results of the knowledge network for entrepreneurship reflected changes in business management, where long-term vision and collaborative relationships played a pivotal role. These included the establishment of a business with innovative management focused on trust and solidarity, as well as a positive impact in terms of job creation and personalized customer service. The findings derived from Enterprise M reinforce the conclusions drawn by Matthaei and Slaats (2023), who assert that solidarity networks in entrepreneurship are increasingly recognized, offering an economic alternative distinct from traditional frameworks.

In summary, the Knowledge Networks based on Solidarity for Enterprise M are systematically illustrated in Figure 3. From this depiction, it is evident that a network is indeed established based on tacit knowledge, wherein relationships characterized by trust and solidarity play a pivotal role in fostering the enduring growth and consolidation of the business over an extended period. Moreover, this serves as a compelling contrast to traditional views of entrepreneurship, which typically underscore the necessity of possessing a business idea as the sole determinant of success. Conversely, Enterprise M demonstrates that not all individuals conform to the homo economicus model, which prioritizes the maximization of financial gain; instead, some are motivated by interpersonal relationships, empathy, and solidarity.

Figure 3. *Knowledge Networks Based on Solidarity in Entrepreneurship, Enterprise M*



Conclusions

The significance of establishing knowledge networks for entrepreneurship lies in their capacity to form systems designed to catalyze specialized knowledge and complement both material and human resources, with trust and solidarity serving as the fundamental drivers of cooperation. In this context, it is not only crucial to examine the connections between disparate agents but also to consider the institutional role, embodied in both formal and informal institutions, which determines the collective body of knowledge, attitudes, behaviors, and customs that constitute the social environment. This, in turn, facilitates the elucidation of a society's characteristics in relation to its capacity for cohesion, innovation, and the resolution of shared challenges.

The case of Company M allows us to infer that knowledge networks based on solidarity are not automatically formed through mere connections between actors; rather, they are the product of long-term relationships characterized by collaboration, communication, and trust, in which informal institutions play a predominant role by minimizing the likelihood of malicious behavior. Similarly, the case of Organization M enables us to deduce that not all entrepreneurs adopt homo economicus attitudes, where the sole objective is the maximization of economic profits. This perspective provides a reductionist view of entrepreneurship, as entrepreneurs, in fact, embody individuals capable of establishing a system of cooperative relationships with clients, suppliers, employees, and partners, with empathy being a factor overlooked in traditional entrepreneurship studies.

Solidarity depends on the network of interactions through which knowledge is generated, modified, and disseminated among the members of the network. The construction of a knowledge network based on solidarity for entrepreneurship entails a continuous process of seeking links of empathy and mutual support, with profit being a secondary consideration. Thus, it can be concluded that there is a positive relationship between knowledge networks, solidarity, and entrepreneurship, understood as a holistic set of interconnected and complex relationships.

At the same time, while the findings derived from the case study method cannot be generalized due to its focus on a specific case, Company M underscores the impossibility of building knowledge networks through government decree. Empathy and solidarity, as informal institutions, require long-term connections based on trust and ethical values for their consolidation. The research thus offers a novel perspective on the role of knowledge networks in entrepreneurship, highlighting that they are shaped through such relationships, where profit is secondary. This limitation suggests the potential for future studies exploring how network dynamics, grounded in trust and solidarity, function across different contexts, as well as the possibility of creating or attempting to quantify indicators of solidarity within these networks.

Interest conflict declaration

The authors declare not to have.

Authorship contribution

Autor	Concepto	Curación de datos	Análisis/ Software	Investigación / Metodología	Proyecto/ recursos / fondos	Supervisión/ validación	Escritura inicial	Redacción: revisión y edición final
1	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X

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