

Correlational Analysis of the Role of Senior Management in the Development of Dynamic Capacities in SMES

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Abstract: The study analyzes the role of senior management in the development of dynamic capacities in small and medium-sized enterprises (SMEs) in Fresnillo, Zacatecas, to strengthen their sustainable competitiveness. These capabilities allow organizations to adapt and respond to market changes, integrating resources strategically. In a region where 90% of economic units are SMEs and dependence on the mining sector limits diversification, transformational leadership is key to fostering innovation and organizational learning. A mixed methodology was used, combining surveys and interviews with executives of companies with at least three years of operation. The analysis revealed that dynamic capabilities are highly correlated with strategy, organization, resources, and technology. In particular, the ability to adapt showed the greatest relationship with strategy ($r=0.857$), which suggests that clear and flexible planning facilitates the response to changes in the environment. The study concludes that SMEs that develop dynamic capabilities, such as absorption, innovation and learning, show a greater capacity to adapt and grow in changing markets.

Keywords: Dynamic Capabilities, SMEs, Senior Management, Innovation and Sustainable Competitiveness

Introduction

The development of dynamic capacities in small and medium-sized enterprises (SMEs) is key to their sustainability in environments of high economic volatility. According to Teece, Pisano, and Shuen (1997, p. 516), these capabilities allow organizations to integrate, build, and reconfigure their resources to adapt to market changes. In Fresnillo, Zacatecas, where 90% of economic units are SMEs (INEGI, 2022, p. 23), dependence on the mining sector and the lack of industrial diversification present significant challenges.

The study focuses on the role of senior management in developing dynamic capacities to strengthen the sustainable competitiveness of SMEs in this region. Factors that facilitate or hinder its implementation are analyzed, based on a solid theoretical framework and a rigorous methodology. Teece et al. (1997, p. 517) emphasize that these capabilities enhance organizational resilience by anticipating and responding effectively to changes in the environment.

Transformational leadership (Bass & Avolio, 1993, p. 112) is a determining factor, as it motivates employees and fosters a culture of innovation and learning. The study proposes strategies from senior management to strengthen these capacities, identifying their role in implementation, analyzing key dimensions such as adaptability and innovation, and proposing practical solutions to overcome barriers.

A descriptive and correlational methodology was used, combining qualitative and quantitative techniques. The target population were SMEs from Fresnillo with at least three years of formal operation, selected through the local Chamber of Commerce. Surveys and structured interviews were conducted with general managers and members of senior management, evaluating innovation, adaptability and reconfiguration of resources. The analysis used advanced statistical tools and NVivo software to evaluate qualitative responses.

The findings highlight the crucial role of senior management in fostering innovation and organizational learning. Companies with strategic leaders showed greater capacity to adapt to the market. However, barriers such as lack of leadership training, limited access to technology, and financial constraints were identified.

Dynamic capabilities are linked to the history of the organization and its ability to respond to market cycles (Aguilar & René, 2006, p. 12). According to Acevedo-Gálvez and Alboros-Arias (2006, p. 34), these must be novel and inimitable in order to generate competitive advantages. However, García and Martínez (2015, p. 56) warn that the lack of alignment between strategic and operational objectives can hinder their development. Camarena and López (2021, p. 72) relate these capacities to sustainability, promoting clean technologies and efficiency in resource management. Tejeda and Ramírez (2018, p. 89) highlight the importance of organizational learning in adapting to changes, while Calderón and Ruiz (2020, p. 95) highlight technological innovation as a key differentiator in the market.

The study underscores that effective strategic management can turn structural constraints into opportunities for growth. It is recommended to strengthen strategic leadership through training programs, invest

in technology for innovation, and establish strategic alliances with academic institutions and research centers. These findings contribute both to theoretical knowledge and to the practical implementation of strategies for business development in contexts similar to Fresnillo's.

Problem Statement

The problem statement emphasizes the need to clearly identify the phenomenon under study, considering cultural, economic, and political factors (Hernández Sampieri et al., 2010). In Fresnillo, Zacatecas, the economy is based on mining, trade, and manufacturing (INEGI, 2022), but faces problems such as lack of diversification and insecurity, which affects business development (Zea-Fernández et al., 2020). Socially, the migration of young people and the lack of training limit the availability of talent (Fernández, 2023). SMEs, which represent more than 90% of economic units (INEGI, 2022), have difficulties in financing and adopting technologies (Robledo et al., 2020).

Dynamic capacitybuilding in local SMEs faces significant obstacles, such as the lack of strategies for innovation and adaptation to change (Helfat et al., 2007; Zapata Rotundo et al., 2018). Top management is key in this process, as they manage the formulation of strategies and the allocation of resources (Helfat&Peteraf, 2009). However, in Fresnillo, the lack of training in strategic management and the low adoption of technology limit its impact (Ibarra & Herrera, 2009).

The economic environment of the region, dependent on mining and with low diversification, hinders business development (INEGI, 2022). Companies need to strengthen their dynamic capacities to adapt to changing markets (Zapata Rotundo et al., 2018). The absence of tools to measure these capacities prevents the implementation of effective strategies (Winter, 2003, p. 993).

SMEs face barriers in access to technology and financing, which are fundamental for innovation (Bharadwaj, 2000, p. 172; Robledo et al., 2020, p. 48). Overcoming these challenges requires comprehensive strategies that combine leadership, technology, and financing (Eisenhardt & Martin, 2000, p. 1113). Collaboration with educational institutions and the construction of business networks can contribute to this development (Zea-Fernández et al., 2020, p. 89).

General objective

Manage strategies from senior management to promote the Development of Dynamic Capacities in SMEs in Fresnillo, generating sustainable competitiveness.

Specific objectives

- To identify the role of senior management in the development of the dynamic capacities of SMEs in the municipality of Fresnillo, Zacatecas
- To classify the dimensions of the factors that promote dynamic capacities in SMEs in the municipality of Fresnillo, Zacatecas
- Manage strategies according to the dimensions of the factors that promote dynamic capacities in SMEs in the municipality of Fresnillo Zacatecas.

Hypothesis

Hi: The management of strategies from senior management fosters the development of dynamic capacities in SMEs to obtain sustainable competitiveness.

Null hypothesis (H0): There is no significant relationship between the development of dynamic capacities in Fresnillo's SMEs and the growth of their organizations.

Alternative hypothesis (H1): The development of dynamic capacities in SMEs in the city of Fresnillo is positively related to the growth of their organizations.

These hypotheses are based on the idea that strengthening dynamic capacities, which are the ability to adapt, innovate and learn quickly, can have a positive impact on the growth of SMEs in Fresnillo.

State of the Art

Research on organizational strengths highlights their key role in creating, adapting, and transforming new businesses. These resources enable successful market entry and ensure business sustainability. However, Carattoli (2013, p.18) points out that not enough research has been done on how startups take advantage of opportunities from established firms, particularly in training systems.

According to Teece (2007, p.1321), strategic capabilities allow companies to integrate, develop and reorganize internal and external resources to respond to market needs. These capabilities represent a key

differentiation for survival and success in competitive environments. Zahra et al. (2006, p.921) highlight its relationship with innovation and organizational learning, allowing companies to adapt to external changes and strengthen their position in the market.

Eisenhardt and Martin (2000, p.1108) explain that these resources manifest themselves in essential operational processes to identify and exploit opportunities, although SMEs face significant challenges due to their limited financial and human resources. Barreto (2010, p.270) expands the concept of capability to include strategic change, decision-making, and resource management, emphasizing that the ability to adapt is key to taking advantage of opportunities.

Capacity building is not an automatic process but requires additional training and organizational learning based on the exchange of knowledge between leaders, employees, and data (Helfat et al., 2007, p.4). Finally, Winter (2003, p.992) stresses that strategic skills are essential for business sustainability, as they allow innovation in assets, processes and strategies to maintain competitiveness in the market.

Conceptual Theoretical Framework

The theory of dynamic capabilities analyzes how a company achieves competitive advantage through the strategic use of its internal resources (Sáez de ViteriArranz, 2000, p. 132). According to Barney, cited by Vargas-Hernández (2013, p. 45), this theory should focus on the detailed analysis of assets and their impact on productivity and sustainability. Operational capabilities are defined in three dimensions: coordination and innovation, efficient use of resources, and a progressive results-oriented process. However, it is emphasized that resources alone are not enough; its value depends on its management and strategic application (Grindel and Hilderbrand, cited by González Bazaldúa, 2021, p. 89).

Adaptive capabilities allow innovative organizations to develop new products and anticipate market trends (Rotundo, 2020, p. 54). These include innovation, knowledge integration, and strategic decision-making (Eisenhardt & Martin, 2021, p. 45). Wang (2007, p. 112) highlights that these capacities facilitate coordination and efficient use of resources in contexts of change, ensuring a sustainable competitive advantage. Verona (2003, p. 135) highlights the importance of the absorption of external knowledge to adapt to the changing environment.

Importance of Dynamic Capabilities in Competitiveness

In a turbulent market, adaptability is key to competitiveness. Teece, Pisano, and Shuen (1997, p. 520) define dynamic capacities as the ability to reconfigure internal and external competencies to face change. Eisenhardt and Martin (2000, p. 1110) emphasize that these capabilities foster innovation through strategic routines. Helfat et al. (2007, p. 5) and Barreto (2010, p. 256) highlight its evolutionary nature and its impact on organizational flexibility.

Organizational resilience is related to the ability to adapt and grow in the face of challenges (Sutcliffe & Vogus, 2003, p. 98). Hamel and Valikangas (2003, p. 55) emphasize innovation in adverse conditions, while Linnenluecke (2017, p. 28) highlights the need for organizational stability for continuous adaptation. Lengnick-Hall et al. (2011, p. 246) identify resilience as a strategic tool that allows anticipating and mitigating disruptions.

Teece (2009, p. 1324) argues that uncertainty management skills include perception and rapid response to changes in the environment. Knight (1921, p. 235) states that uncertainty requires qualitative skills, such as decision-making under risk. Uttner et al. (2003, p. 210) state that resilience allows companies to manage risks and take advantage of opportunities.

Dynamic capabilities and organizational sustainability are interconnected. Hart and Dowell (2011, p. 17) highlight the integration of economic, social, and environmental objectives into business strategy. Aragón-Correa and Sharma (2003, p. 76) argue that companies with sustainable adaptive capacities respond better to environmental regulations and stakeholder needs.

The relationship between innovation and dynamic capabilities is crucial for change management. Christensen (1997, p. 123) introduces the concept of disruptive change, pointing out that innovation allows new opportunities to be identified. Tidd, Bessant, and Pavitt (2005, p. 215) highlight how innovation transforms strategic processes. Teece (2009, p. 1329) emphasizes that these capabilities facilitate the management of technological uncertainty.

Evolution of Dynamic Capabilities in SMEs

SMEs face greater challenges in developing dynamic capacities due to their limited financial and technological resources. Teece (2007) states that these capabilities allow internal and external competencies to be integrated and adapted in response to market changes. Eisenhardt and Martin (2000) emphasize that organizational dynamism depends on continuous learning and the reorganization of resources.

Winter (2003) stresses that adaptability is a key advantage in SMEs, allowing rapid changes to take advantage of emerging opportunities. Innovation is essential for organizational transformation, since companies must adapt to constantly evolving markets (Teece, 2009).

Organizational learning is essential in the development of dynamic capabilities, enabling SMEs to improve their competitiveness through knowledge absorption and rapid response to market threats (Eisenhardt and Martin, 2000). In addition, resource restructuring and strategic decision-making play a key role in business sustainability (Winter, 2003).

Collaboration with other companies strengthens the dynamic capacities of SMEs. Eisenhardt and Martin (2000) highlight that strategic alliances allow access to new resources and knowledge. Winter (2003) points out that the development of these capacities requires investments in learning, resources and time.

Teece (2009) concludes that dynamic capabilities not only allow adaptation to the environment, but also create new business opportunities. The evolution of these capabilities is a continuous process that ensures long-term success in competitive and ever-changing markets.

Board

SME Comparison

Author	Main concept	Developments in SMEs
Eisenhardt and Martin (2000)	Dynamic capabilities as time-dependent processes that enable resource recombination	SMEs must develop efficient processes to maximize the use of limited resources
Winter (2003)	Adaptability as a competitive advantage derived from dynamic capabilities	SMEs must adjust their operations quickly to capitalize on emerging opportunities
Teece (2007)	Dynamic capabilities allow for the integration, building and reconfiguration of competencies	In SMEs, these capabilities are key to adapting and anticipating market changes
Teece (2009)	Dynamic capabilities foster innovation in high-uncertainty environments	SMEs that develop these

Note: A comparison of the evolution of dynamic capacities is shown Source: own elaboration based on Eisenhardt and Martin (2000), Winter (2003), Teece (2007), Teece (2009)

Key Functions of Senior Management

Top management is critical to the achievement of strategic goals and long-term organizational success. Her key roles include strategy formulation, decision-making, leadership and motivation, organizational development, and change management.

- 1. Strategy Formulation:** Top management establishes the strategic direction of the organization, defining markets, products, and competitive differentiation (Drucker).
- 2. Decision-making:** Herbert A. Simon highlights that managerial decision-making is limited by the time and resources available, which requires skills to manage uncertainty.
- 3. Leadership and Motivation:** Kotter emphasizes the importance of inspiring employees and fostering a clear organizational vision.
- 4. Organizational Development:** Yukl points out that senior management must ensure adequate structures and resources to execute the strategy.
- 5. Change Management:** Maxwell highlights the need for effective communication and leadership in transformation processes.

Senior Management and Dynamic Capabilities

Dynamic capabilities allow companies to integrate, build, and reconfigure resources in a changing environment (Teece, 2018). Mintzberg (2009) stresses that strategic leadership is key to change management and the development of these capabilities.

- 1. Agile Decision-Making:** Eisenhardt and Sull (2001) highlight that organizations with dynamic capabilities stand out for their speed in making strategic decisions.
- 2. Culture of Innovation:** Christensen (2013) emphasizes that leaders must foster organizational structures that encourage creativity.
- 3. Risk Management:** Miller and Waller (2003) highlight the ability of senior management to anticipate threats and design mitigation strategies.

4. **Leveraging Strategic Resources:** Barney (1991) emphasizes that leaders must identify and develop the company's key resources.
5. **Organizational Learning:** Senge (2006) highlights that continuous learning allows organizations to innovate and anticipate future challenges.
6. **Reconfiguration of Resources:** Helfat and Peteraf (2003) state that the ability to reallocate resources strategically is key to organizational adaptation.

Influence of Top Management on Organizational Culture

Organizational culture defines the identity, values, and practices of a company (Schein, 2010). Top management influences its development through:

1. **Establishment of Values:** Schein (2010) highlights that leaders model organizational values.
2. **Behavior Modeling:** Deal and Kennedy (1982) argue that the daily actions of leaders define organizational culture.
3. **Effective Communication:** Cameron and Quinn (2011) highlight the importance of clear communication to transmit cultural values.
4. **Support for Innovation:** Quinn et al. (2003) argue that a culture of learning drives innovation.
5. **Change Management:** Kotter (1996) emphasizes that strong management is key in periods of transformation.

Organizational leadership also impacts culture through strategic decision-making, reward systems, and leadership style. Kotter and Heskett (1992) state that a strong organizational culture improves performance and facilitates adaptation to change.

Senior Management Engagement and Dynamic Capabilities

Top management directly influences the development of dynamic capabilities, which allow organizations to adapt and renew themselves in an uncertain environment (Teece, Pisano & Shuen, 1997).

1. **Strategic Decision-Making:** Eisenhardt and Martin (2000) emphasize that these capabilities depend on the experience and judgment of leaders.
2. **Investment in Innovation and Talent:** Senior management must prioritize technology and human capital to strengthen competitiveness.
3. **Transformational Leadership:** Bass (1990) highlights that this leadership style drives innovation and organizational resilience.
4. **Organizational Culture:** Schein (2010) points out that leaders are architects of organizational culture, promoting experimentation and learning.
5. **Knowledge Management:** Nonaka and Takeuchi (1995) argue that effective knowledge management boosts business competitiveness.
6. **Flexible Structure:** Helfat et al. (2007) state that structural flexibility is key to the rapid reconfiguration of resources and strategies.

Factors Fostering Dynamic Capabilities

Collis (1994) emphasizes that innovation and adaptation are essential for organizational competitiveness. Eisenhardt and Martin (2000) propose that dynamic capacities are manifested through strategic routines and resource configurations.

1. **Strategic Vision:** Teece (2007) highlights the importance of senior management in detecting opportunities and threats.
2. **Organizational Culture:** Schein (2010) emphasizes that a flexible and continuous learning culture favors innovation.
3. **Knowledge Management:** Nonaka and Takeuchi (1995) argue that organizational knowledge is a key strategic resource.
4. **Organizational Structure:** Helfat et al. (2007) argue that it must be flexible enough to allow the reconfiguration of resources.
5. **Transformational Leadership:** Bass (1990) highlights that it inspires employees to exceed expectations and embrace change.
6. **Adoption of Advanced Technologies:** Venkatraman (1994) highlights the role of digitalization in informed decision-making.
7. **External Collaboration:** Teece (2007) emphasizes the importance of strategic alliances to access new resources and knowledge.

Table: Factors that promote dynamic capabilities

Factors that promote dynamic capabilities		
Factor	Description	Author(s)
Strategic Vision	Top management must detect opportunities and threats, mobilizing resources.	Teece (2007); Teece, Pisano & Shuen (1997)
Organizational Culture	It promotes innovation, flexibility and continuous learning in adapting to change.	Schein (2010)
Innovation	Reconfiguration of resources and processes to adapt to new demands.	Eisenhardt & Martin (2000)
Knowledge Management	Capture, transfer and effective application of knowledge to adapt quickly.	Nonaka & Takeuchi (1995)
Organizational Structure	Structural flexibility to allow for rapid reconfiguration of resources.	Helfat et al. (2007)
Transformational Leadership	Inspire and motivate employees to exceed expectations and embrace change.	Bass (1990)
Adoption of Advanced Technologies	Digitalization that facilitates informed and agile decision-making.	Venkatraman (1994)
Organizational Learning	Promotes continuous learning to improve processes and products.	Garvin (1993)
External Collaboration	Strategic alliances that allow access to new knowledge and technologies.	Teece (2007)

Note: a comparative table of the factors that promote dynamic capacities is shown Source: own elaboration based on various authors cited

Dimensions of Dynamic Capabilities

Innovation Capacity

The capacity for innovation allows companies to generate and apply new ideas, processes, and products to stay competitive (Teece, 2007). According to Schumpeter (1934), innovation is the engine of economic growth and the main source of competitive advantage (p. 63). It is also related to leadership, since fostering creativity and experimentation allows disruptive innovations to be generated (Dyer, Gregersen, & Christensen, 2011, p. 45).

Organizational Capacity

It refers to the ability of the organization to structure and coordinate its resources effectively (Helfat & Peteraf, 2003, p. 998). Structural flexibility is key, since it allows rapid adjustments to changes in the environment (Mintzberg, 1979, p. 123). It also involves decentralized, team-based structures to improve decision-making (Galbraith, 1977, p. 189).

Relational Capacity

It is the ability of the organization to manage relationships with other companies, customers and suppliers. Interorganizational networks allow access to external resources (Dyer & Singh, 1998, p. 672). Companies with strategic networks can keep up with technological and market trends (Gulati, Nohria, & Zaheer, 2000, p. 208). In addition, strong customer relationships build loyalty and trust (Morgan & Hunt, 1994, p. 22).

Adaptability

It involves the ability to adjust strategies and processes to respond to changes in the environment (Chakravarthy, 1982, p. 35). Organizational agility is key to strategic renewal (Doz & Kosonen, 2010, p. 376). Change management plays an essential role in facilitating the transition and acceptance of new strategies (Kotter, 1996, p. 39).

Absorption Capacity

It is the ability to recognize the value of external knowledge and apply it internally (Cohen & Levinthal, 1990, p. 128). Investment in R+D favors the absorption and application of new knowledge (Zahra & George, 2002, p. 188). Knowledge management is key to integrating external information into organizational processes (Nonaka & Takeuchi, 1995, p. 85).

Detection Capability

Ability to identify opportunities and threats in the environment (Teece, 2007, p. 1325). It includes the use of competitive intelligence to anticipate market changes (Porter, 1985, p. 104). It also implies strategic foresight to identify long-term trends (Day & Schoemaker, 2005, p. 27).

Integration Capability

It refers to the ability to coordinate resources and competencies to achieve strategic objectives (Grant, 1996, p. 375). Human resource management is key to aligning internal capabilities with strategy (Barney & Wright, 1998, p. 34). Project management also facilitates the integration of resources (Hobday, 2000, p. 876).

Learning Capacity

It allows the acquisition, application and continuous improvement of organizational knowledge (Argyris & Schön, 1978, p. 67). A culture of continuous learning is essential for the development of dynamic capacities (Senge, 1990, p. 114). Feedback and continuous improvement strengthen organizational adaptation (Deming, 1986, p. 47).

Methodology

In this research, a mixed methodological approach was adopted that combined both qualitative and quantitative methods, allowing a comprehensive analysis of the role of senior management in the development of dynamic capacities in SMEs in Fresnillo, Zacatecas. The study began with the identification and selection of participating companies, which had to be in operation for at least three years to ensure that they were mature enough to implement effective management and leadership strategies. Small and medium-sized companies registered in Fresnillo were established as the target population, and of the 420 companies in the registry, those that met the seniority criteria were chosen, adding up to a total of 120.

The research design was descriptive and correlational, focused on understanding how the dynamic capabilities of firms, such as absorption, innovation, learning and adaptation, influence their competitiveness. To collect the necessary data, structured surveys were used aimed at general managers and members of the senior management of SMEs, with the aim of obtaining quantitative information on the level of development of these capabilities in each company. In addition, structured interviews were conducted with key managers and executives, allowing to obtain a deeper perspective on the strategies implemented and the challenges faced in the management of dynamic capabilities.

With the data collected, a detailed statistical analysis was carried out, using advanced tools to calculate averages and make correlations between the different dynamic capacities and organizational characteristics, such as structure and technological resources. The qualitative data obtained from the interviews were analyzed using NVivo software, which facilitated the identification of recurring patterns and themes related to strategic management and leadership in SMEs. This analysis integrated the quantitative findings, providing a more complete context on how senior management decisions impact the development and strengthening of dynamic capabilities in companies.

Validating the hypotheses was a key step in the research. Assumptions related to the key role of senior management in building dynamic capacities that contribute to the sustainable competitiveness of SMEs were confirmed. At the same time, the null hypothesis, which stated the lack of a significant relationship between dynamic capabilities and organizational performance, was rejected. The results showed a positive and significant relationship between dynamic capabilities and sustained growth of firms, highlighting the importance of innovation and learning in the creation of competitive advantages.

In this methodological proposal, the population and the study universe are made up of small and medium-sized enterprises (SMEs) in the city of Fresnillo, Zacatecas, which meet the following criteria:

1. They are registered in the register of Commerce, Squares and Markets of the municipality.
2. They have been in existence for at least three years.

The delimitation of these criteria is essential to ensure the validity and reliability of the results, as it allows for the establishment of a well-defined framework for action. According to the Chamber of Commerce of the Municipality of Fresnillo, the 2024 census indicates that there are 420 registered SMEs, of which 120 are more than three years old.

Results

The analysis carried out in SMEs in Fresnillo, Zacatecas, identifies four main dimensions of dynamic capacities: absorption, innovation, learning and adaptation. These dimensions are fundamental to organizational competitiveness, allowing companies to respond to changes and take advantage of emerging opportunities

(Teece, 2007). The results reflect a moderately high development in these capacities, with means ranging from 3,802 to 3,929, which supports the importance of their implementation to improve organizational performance (Barney, 1991; Eisenhardt & Martin, 2000).

Correlations between dynamic capabilities and senior management variables

Correlation coefficients are presented between four strategic dimensions (Strategy, Organization, Resources, Technology) and the first variables (Absorption, Innovation, Learning, Adaptation). The coefficients are as follows:

Absorption: High correlations with Strategy (0.7897), Organization (0.7997), Resources (0.7131), and Technology (0.7393).

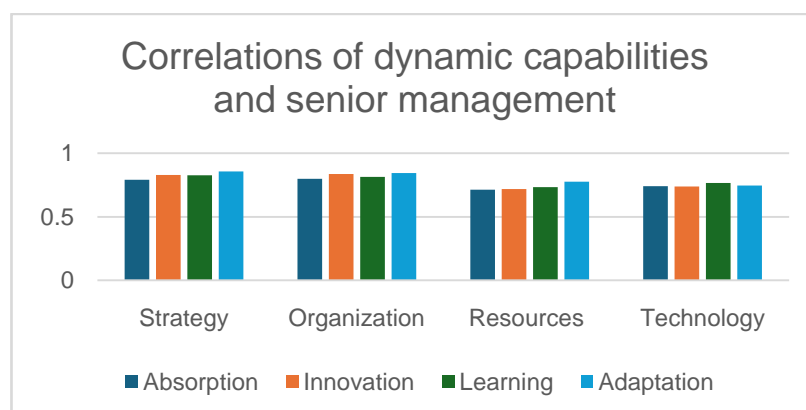
Innovation: Notable correlations with Strategy (0.8299), Organization (0.8362), Resources (0.7184), and Technology (0.7375).

Learning: Important relationship with Strategy (0.8255), Organization (0.8128), Resources (0.7338), and Technology (0.7659).

Adaptation: High correlations with Strategy (0.8570), Organization (0.8450), Resources (0.7770), and Technology (0.7461).

Table: Correlations of dynamic capabilities and senior management

	Strategy	Organization	Resources	Technology
Absorption	0.7897	0.7997	0.7131	0.7393
Innovation	0.8299	0.8362	0.7184	0.7375
Learning	0.8255	0.8128	0.7338	0.7659
Adaptation	0.8570	0.8450	0.7770	0.7461



These correlations reflect significant relationships between the strategic/organizational factors and the capabilities analyzed, suggesting a possible interdependence.

The interpretation of each correlation depends on the value of the coefficient (r) and its context. In general, correlation coefficients have the following interpretive range:

- 0.19: Very weak or non-existent correlation.

0.20 - 0.39: Weak correlation.

0.40 - 0.59: Moderate correlation.

0.60 - 0.79: High correlation.

0.80 - 1.00: Very high correlation.

1. Absorption

- **Strategy (0.7897):** There is a high correlation, suggesting that a well-defined strategy significantly influences the organization's ability to absorb knowledge.
- **Organization (0.7997):** The organizational structure has a similar impact on absorption, probably facilitating the management of information and resources.
- **Resources (0.7131):** Effective resource management is also highly related to absorptive capacity, although with less influence than Strategy and Organization.
- **Technology (0.7393):** Technology contributes significantly, allowing new knowledge to be processed and applied efficiently.

2. Innovation

- **Strategy (0.8299):** Very high correlation, meaning that a clear and well-executed strategy directly fosters organizational innovation.
- **Organization (0.8362):** Similar to Strategy, a well-structured organization facilitates the creation of innovations.
- **Resources (0.7184):** The efficient allocation of resources has a high relationship with innovation, since it guarantees the necessary support for creative processes.
- **Technology (0.7375):** Technology also plays a crucial role in innovation, promoting new ways of approaching problems.

3. Learning

- **Strategy (0.8255):** Very high correlation indicating that a solid strategy is essential to foster organizational learning.
- **Organization (0.8128):** The organizational structure plays a key role in enabling and sustaining learning processes.
- **Resources (0.7338):** Available resources influence the ability to learn, although less than Strategy and Organization.
- **Technology (0.7659):** Technology is also related to learning, allowing access to educational tools and platforms.

4. Adaptation

- **Strategy (0.8570):** The highest correlation in the analysis, suggesting that strategy is a fundamental determinant for an organization to be able to adapt to change.
- **Organization (0.8450):** It also shows a very high ratio, indicating that a good organizational structure facilitates flexibility and response to change.
- **Resources (0.7770):** The available resources have a high correlation, highlighting their importance in the ability to adapt.
- **Technology (0.7461):** Although slightly lower, technology is still a relevant factor for adaptation, helping organizations stay competitive.

Conclusions and Recommendations

The study carried out in SMEs in Fresnillo, Zacatecas, analyzes the role of senior management in the generation and strengthening of dynamic capacities, fundamental for sustainable competitiveness. The results indicate that although companies recognize the importance of adaptation and innovation, they face significant barriers such as the scarcity of financial resources and the lack of a clear strategic framework. Dynamic capabilities, such as absorption, innovation, learning and adaptation, are essential for SMEs in the context of a changing market (Teece, Pisano & Shuen, 1997).

Development and Relevance of Dynamic Capabilities

Dynamic capabilities allow SMEs to adapt and anticipate emerging trends, putting them in a favorable position to compete. However, Fresnillo businesses face challenges related to funding, leadership training, and lack of access to innovative technologies. Investment in the development of capabilities such as adaptability and flexibility, together with the integration of innovative technologies, is crucial to face crises and transform challenges into opportunities (Sutcliffe and Vogus, 2003).

Hypothesis Validation

The analysis confirms that strategic management of senior management fosters the development of dynamic capabilities, resulting in sustainable competitiveness. Dynamic capabilities are critical for organizational growth, as SMEs that adopt innovation- and learning-oriented practices achieve sustained growth and greater resilience in the face of market changes. The null hypothesis was rejected, confirming that there is a positive relationship between dynamic capabilities and organizational growth (Eisenhardt & Martin, 2000).

Impact of Top Management on Organizational Culture

Top management plays an essential role in forming an organizational culture that promotes learning and innovation. Mintzberg (2009) stresses that strategic leadership generates a shared vision that motivates employees to continuously improve. However, the lack of strategic management training limits the potential of these initiatives, highlighting the need for training programs and feedback spaces within organizations.

Innovation and Sustainability

The research confirms that dynamic capabilities are not only essential for business survival, but also for creating sustainable competitive advantages. SMEs that adopt sustainable practices, such as resource efficiency and social responsibility, also improve their market position. However, they face significant barriers to adopting clean technologies due to a lack of government funding and support. It is recommended to promote public policies that encourage innovation and sustainable development.

Challenges and Opportunities

SMEs in Fresnillo face challenges related to dependence on mining and lack of technical training. It is crucial that they take a proactive approach to developing capacities such as adaptation to change, knowledge absorption and innovation. Collaboration with educational institutions and business networks could improve this process and provide access to additional resources and management expertise.

Practical and Theoretical Contributions

This study provides a practical guide for SMEs to develop dynamic capacities through adaptive and innovative strategies. The integration of assessment tools and strategic leadership training are critical to strengthening competitiveness. Theoretically, the understanding of the role of senior management in the development of dynamic capabilities is broadened, considering the importance of the economic environment and organizational culture (Helfat & Peteraf, 2009). It is recommended that future research delves into the relationship between dynamic capabilities and digital transformation in business competitiveness.

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