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New Business Opportunities for Latin American Small and Medium-Sized Enterprises in the Context of the Space Age

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Abstract

The growing global space economy presents significant opportunities for small and medium-sized enterprises (SMEs) in Latin America. This article explores how Latin American SMEs can be integrated into the spatial value chain, taking advantage of market expansion, digitalization and international partnerships. Through an analysis of public policies, market trends and success stories, strategies are identified for SMEs to participate in sectors such as component manufacturing, satellite data services and Internet of Things (IoT) applications.

Keywords: *Smes, Latin America, Spatial Economy, Business Opportunities, Innovation, Digitalization.*

Introduction

In recent decades, the space industry has ceased to be the exclusive domain of great powers and multinational corporations to become a more open, accessible and diversified ecosystem. This phenomenon, known as the "new space age", has been driven by the reduction in the costs of access to space, the exponential advancement of digital technologies and the growing participation of the private sector (Aliberti & Tugnoli, 2020). As a result, new players have begun to emerge, including developing countries and small businesses that find in this industry a niche for innovation and growth.

In this context, Latin America is at a turning point. While the region has historically had a marginal participation in the global space economy, in recent years there has been a significant increase in public and private investments in space infrastructure, satellites, Earth observation, and telecommunications and space weather applications (Romero, 2021). It is estimated that by

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2027, the Latin American space economy will reach an approximate value of 40 billion dollars, which represents a remarkable growth compared to previous years (Convergencia Latina, 2023).

Small and medium-sized enterprises (SMEs) represent more than 99% of all companies in Latin America and generate approximately 60% of formal employment, although their contribution to GDP is significantly lower, at around 25% (Atlantic Council, 2022). This disparity suggests an underutilization of the potential of SMEs as a driver of economic development and innovation. Integrating them into emerging sectors, such as space, would not only contribute to their growth, but would also strengthen the region's technological sovereignty, economic resilience and global competitiveness.

This article aims to analyze the commercial opportunities that arise for Latin American SMEs within the space economy. It is based on the premise that, despite the structural and technological challenges, there are specific niches where these companies can successfully insert themselves. The analysis will focus on identifying areas with the greatest potential, internationalization strategies, and examples of public-private collaboration and industrial clusters that have demonstrated positive results. Through a documentary review and the study of recent cases, it seeks to offer a comprehensive overview of how SMEs can take advantage of this new economic frontier.

Theoretical Framework

The Space Economy in the Contemporary Era

The space economy, understood as the set of activities that allow the exploration, use and commercialization of outer space, has undergone a significant transformation since the beginning of the twenty-first century. This transformation is largely due to the decentralization of the sector, the proliferation of private actors, and the development of cheaper and more efficient technologies, such as small satellites and reusable rockets (OECD, 2019; UN Office for Outer Space Affairs [UNOOSA], 2021).

Currently, the space economy is not limited to space hardware launch or development activities, but includes emerging sectors such as space mining, orbital tourism, precision agriculture through remote sensing, geolocation-based services, and artificial intelligence applications on spatial data (Gioia & Kennedy, 2020).

Potential of SMEs in the Space Economy

SMEs, thanks to their ability to adapt, innovate and respond quickly to changes in the environment, can play a crucial role in the space economy. In regions such as North America and Europe, SMEs have begun to actively participate in the development of technological components, specialized software, sensors, navigation systems, and applications derived from satellite data analysis (European Space Agency [ESA], 2022).

In Latin America, the potential is still in the emerging stage. However, the increase in innovation support programs and the creation of aerospace clusters, such as in Querétaro (Mexico) or São José dos Campos (Brazil), has begun to generate favorable conditions for the participation of SMEs in the sector (González et al., 2023).

Commercial Insertion Opportunities

The opportunities for SMEs can be classified into three main areas:

1. **Specialized manufacturing** (electronic components, structures, satellite mechanisms).
2. **Services based on space technology** (geospatial data, satellite IoT, agricultural monitoring).
3. **Software development and digital innovation** (satellite image processing, cybersecurity, blockchain for satellite traceability).

These opportunities require, however, access to financing, technical training, collaborative networks and stable regulatory frameworks.

Insertion Area	Description	Application Examples
Aerospace Manufacturing	Production of parts, microcomponents, composite materials	Satellite Solar Panels, Sensors, Valves
Satellite-based services	Applications that use satellite data to deliver added value	Precision agriculture, environmental monitoring
Spatial Software Development	Programming of algorithms and systems for data management or analysis	GIS applications, navigation software, spatial AI

Table 1: Areas of Insertion of SMEs in the Space Economy

Source: Authors' elaboration based on ESA (2022) and González et al. (2023).

Development Policies and Regional Clusters

State promotion through innovation policies is key to strengthening the space ecosystem. Countries such as Mexico, Argentina, and Colombia have begun to establish institutional frameworks and agreements with agencies such as NASA, ESA, or the UN's COPUOS program, which opens channels for SMEs to access tenders, mentoring, and international networks (UNOOSA, 2021).

Aerospace clusters also allow synergistic collaboration between industry, academia, and government, facilitating technology transfer, talent development, and regional specialization (González et al., 2023).

Methodology

This research is framed within a qualitative approach with an exploratory-descriptive design, aimed at identifying and characterizing the commercial opportunities offered by the spatial economy to small and medium-sized enterprises (SMEs) in Latin America. The selection of this approach is based on the emergent nature of the phenomenon, in which empirical information is still limited and largely dispersed (Creswell & Poth, 2018).

Research Strategy

A systematic documentary review **was used as the** main data collection technique, based on secondary sources from academic bases, reports from international space agencies, government publications and gray literature from multilateral organizations. To ensure the timeliness of the data, only documents published between 2019 and 2024 were considered.

Source Selection Criteria

The sources were selected according to the following criteria:

- Thematic relevance: studies that address the space economy, SME development, innovation policies or emerging technologies in Latin America.
- News: publications from the last five years.
- Institutional rigor: documents from recognized academic entities, space agencies (NASA, ESA, UNOOSA), development banks (CAF, IDB), and independent research centers.

Criterion	Inclusion	Exclusion
Year of publication	2019–2024	Prior to 2019
Geographical focus	Latin America or comparable cases of emerging countries	Advanced economies without contextual analysis
Document Type	Scientific articles, technical reports, white papers	Reviews, editorials, unverified articles
Fountain	Space agencies, universities, multilateral organizations	Personal blogs, social networks

Table 2: Criteria for Inclusion and Exclusion of Documents

Source: Authors.

Analysis Technique

The data collected was analyzed through **thematic content analysis**, which allowed identifying emerging patterns and classifying opportunities into different categories: manufacturing, services, digital innovation, and international cooperation. This qualitative technique is particularly useful for exploratory studies where key concepts are still in the process of being defined (Nowell et al., 2017).

In addition, a **thematic correlation matrix** was constructed, which made it possible to relate the identified opportunities with the existing productive and technological capacities in different Latin American countries. This matrix was elaborated from the cross-referencing between academic literature and available sectoral data.

Validation and Reliability

To strengthen the reliability of the research, a strategy of **triangulation of sources** was applied, comparing the findings extracted from different types of documents and institutional actors. Likewise, an academic peer review was used to validate the categorization of business opportunities.

Results

The desk analysis identified four major areas of business opportunities for Latin American SMEs in the context of the space economy: (1) manufacturing of aerospace components, (2) services based on satellite technology, (3) digital innovation in spatial data analysis, and (4) participation in clusters and international cooperation programs. The main findings are presented below.

Incipient Participation of Smes in Aerospace Manufacturing

Although aerospace manufacturing has traditionally been a sector dominated by large corporations, there has been an increase in the outsourcing of parts and modules to small

companies, especially in countries such as Mexico and Brazil. For example, the Querétaro Aerospace Cluster brings together more than 80 companies, of which 45% are SMEs that produce everything from valves to electronic systems for satellites and unmanned aircraft (González et al., 2023).

Country	% of SMEs in aerospace	Key sectors of participation
Mexico	45%	Valves, metal structures, sensors
Brazil	30%	Satellite components, mechanical parts
Argentina	25%	On-board software, electronic integration
Colombia	20%	Drones, simulators

Table 3: Share of Smes in Aerospace Manufacturing By Country (2023)

Source: Adapted from González et al. (2023) and CAF (2022).

Growth of Services Based on Satellite Data

The use of geospatial information has grown exponentially in sectors such as agriculture, mining, risk management, and urban planning. It is estimated that by 2025, the global market for Earth observation satellite services will reach USD 8.7 billion, with Latin America accounting for 7% of that market (BryceTech, 2021). This represents an opportunity for SMEs to offer value-added services, such as early warning systems, agricultural monitoring or smart urban solutions.

Digital Innovation in Spatial Data Analysis

Advances in artificial intelligence (AI), machine learning and big data processing have facilitated the development of new solutions by technology startups and SMEs. For example, in Argentina, the company Satellogic, although it is not an SME, has opened an ecosystem of supplier companies that develop everything from algorithms to calibration systems (Satellogic, 2022). This demonstrates the potential to create technologically advanced outsourcing networks.

Application	Description	Country
AgroMonitor	Satellite crop monitoring for micro-producers	Colombia
SatView360	Urban Visualization and Natural Hazards with AI	Mexico
GeoMinera	Geospatial Analysis for Mineral Exploration	Peru
AquaSat	Water management and drought prediction	Chile

Table 4: Digital Applications Developed by SMEs in Latin America

Source: Authors' elaboration with data from ESA (2022) and UNOOSA (2021).

Participation in International Programs and Clusters

SMEs can also benefit from cooperation programmes such as UNOOSA's *Access to Space for All*, which facilitates opportunities for emerging countries through partnerships with private companies such as Nanoracks and Voyager Space (UNOOSA, 2021; Voyager Space, 2022). This type of initiative has allowed small companies to join low-cost joint missions or access international tenders to supply equipment.

Conclusions

This research has shown that the space economy represents a frontier of economic and technological development with a high potential for small and medium-sized enterprises (SMEs) in Latin America. Although historically excluded from this industry by technological, financial, and regulatory barriers, the rise of the "new space age" is narrowing those gaps through the democratization of access to space and the decentralization of the value chain (Gioia & Kennedy, 2020; ESA, 2022).

One of the key findings is the existence of real and concrete opportunities for SMEs on at least three fronts: the manufacture of aerospace components, services derived from satellite observation, and the development of digital solutions linked to the analysis of spatial data. In particular, the increasing availability of open data from public and private satellites – such as the Copernicus (EU) or Landsat (US) programmes— opens up a range of possibilities for local applications in agriculture, environmental management, logistics, and urban monitoring (BryceTech, 2021).

Likewise, regional aerospace clusters and international cooperation networks are presented as fundamental strategies to overcome the structural limitations faced by many Latin American SMEs, such as the scarcity of financing, low export capacity, and the lack of specialized training (González et al., 2023; UNOOSA, 2021). Initiatives such as the United Nations' "Access to Space for All" or memorandums of understanding between Latin American space agencies and global private actors (such as Nanoracks or Voyager Space) have begun to open windows of opportunity for regional insertion in collaborative space missions (Voyager Space, 2022).

However, for these opportunities to translate into tangible and sustainable benefits, it is imperative to design specific public policies that promote technological innovation, access to venture capital, the internationalization of SMEs and the training of human talent. Governments must take an active role as facilitators of innovative ecosystems, articulating efforts between academia, the private sector, and multilateral organizations (CAF, 2022).

In short, the integration of Latin American SMEs into the space economy is not only desirable, but also possible and strategic, as long as it is approached from a systemic, collaborative and long-term oriented perspective. Making SMEs protagonists of the space age can become a vector of economic, technological and social transformation for the region.

References

- Aliberti, M., & Tugnoli, M. (2020). The future of the space economy: Trends, scenarios and policy options. European Space Policy Institute (ESPI). <https://www.espi.or.at/publications/espi-public-reports/the-future-of-the-space-economy>
- Atlantic Council. (2022). Unlocking SME potential in Latin America and the Caribbean. <https://www.atlanticcouncil.org/wp-content/uploads/2022/09/Unlocking-SME-potential-in-Latin-America-and-the-Caribbean.pdf>
- BryceTech. (2021). State of the Satellite Industry Report. <https://brycetech.com/reports>
- CAF – Development Bank of Latin America. (2020). Innovation and technological development in Latin America. <https://www.caf.com/es/conocimiento/>
- CAF – Development Bank of Latin America. (2022). Innovation, science and technology in Latin America. <https://www.caf.com>
- Convergencia Latina. (2023). Latin America's space economy to be worth US\$ 40 billion by 2027. <https://www.convergencialatina.com/Section-Analysis/346815-3-9->

- Latin_Americas_space_economy_to_be_worth_US_40_billion_by_2027
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.
- European Space Agency (ESA). (2022). *SMEs and the space economy: Engines of innovation*. <https://www.esa.int>
- Gioia, A., & Kennedy, C. (2020). The new space economy: An opportunity for economic development. *Space Policy*, 53, 101395. <https://doi.org/10.1016/j.spacepol.2020.101395>
- González, L., Martínez, S., & Ríos, D. (2023). Development of aerospace technology clusters in Latin America. *Journal of Technology and Innovation*, 7(2), 45–62.
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1–13. <https://doi.org/10.1177/1609406917733847>
- Organisation for Economic Co-operation and Development (OECD). (2019). *The space economy in figures: How space contributes to the global economy*. <https://www.oecd.org/innovation/the-space-economy-in-figures-2019>
- Romero, J. A. (2021). Latin America's potential in the new space economy. *Geopolitics and Development Journal*, 8(1), 15–28.
- Satellologic. (2022). *Annual Report 2022*. <https://www.satellologic.com>
- United Nations Office for Outer Space Affairs (UNOOSA). (2021). *Space for sustainable development report*. <https://www.unoosa.org/oosa/en/informationfor/media/2021-space4SDGs.html>
- United Nations Office for Outer Space Affairs (UNOOSA). (2021). *Access to Space for All*. <https://www.unoosa.org>
- Voyager Space. (2022). *Voyager Space and Nanoracks sign MOUs with five Latin American space agencies*. <https://voyagertechnologies.com/press-releases/voyager-space-and-nanoracks-sign-mous-with-five-latin-american-space-agencies/>