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DIGITAL TRANSFORMATION AND INCLUSIVE LEADERSHIP: A QUANTITATIVE ANALYSIS OF ITS IMPACT ON THE PRODUCTIVITY OF LATIN AMERICAN SMES

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Summary
This article synthesizes recent quantitative evidence (2020–2025) on the relationship between digital transformation (DT), inclusive leadership (LI), and SME productivity in Latin America and the Caribbean (LAC). Based on meta-analyses and institutional reports, we show: (1) a positive and moderate effect of digital technologies on business performance (Oduro et al., 2023); (2) systematic effects of LI on key outcomes at the people level—task performance, organizational citizenship, creativity, innovation, and voice—mediated by psychological safety and empowerment (Li et al., 2024); and (3) significant digital adoption gaps in LAC SMEs that limit productivity gains (OECD/CAF/SELA, 2024; ECLAC, 2024; IDB, 2022). An integrative model is discussed in which DT affects productivity through digital capabilities and management practices, and the LI acts as a catalyst that converts digital investment into operational and innovation improvements.

Keywords: digital transformation; inclusive leadership; productivity; SMEs; Latin America and the Caribbean.

Introduction

Small and medium-sized enterprises (SMEs) are the backbone of Latin American economies, representing more than 99% of total productive units and around 60% of formal employment in the region (OECD/CAF/SELA, 2024). However, their productivity remains significantly below the average of large companies and their counterparts in developed economies, which limits their international competitiveness and their contribution to sustainable economic growth (ECLAC, 2024). This lag has been largely attributed to the low adoption of digital technologies, limitations in access to financing, and deficiencies in the training of human talent (IDB, 2022).

Digital transformation (DT), understood as the strategic integration of emerging technologies into organizational processes, has established itself as a key factor in driving innovation, operational efficiency, and value creation in business (Oduro et al., 2023). In particular, technologies such as artificial intelligence, data analytics, the Internet of Things, and automation have demonstrated positive and moderate effects on organizational performance, with more pronounced impacts on the capacity for innovation and the efficiency of internal processes (Oduro et al., 2023). However, in the case of Latin American SMEs, the implementation of these tools often faces cultural and organizational barriers, which prevent technological investment from translating into a sustained increase in productivity (World Bank, 2024).

In this context, the role of inclusive leadership (LI) becomes relevant, defined as the set of behaviors that promote participation, diversity, and psychological safety in work teams (Al-Atwi & Al-Hassani, 2021). Recent evidence shows that LI has positive effects on creativity, innovation, employee voice, and task performance, with psychological safety and empowerment being mediating mechanisms of this relationship (Li et al., 2024). For SMEs in Latin America, where structures are often more flexible but also more vulnerable to resistance to change, LI can be a catalyst to facilitate digital adoption and turn technology investment into tangible performance improvements.

The joint analysis of TD and LI is particularly relevant in the post-pandemic scenario, where digitalization is no longer an option but a necessary condition for survival. Multilateral organizations warn that, despite technological acceleration during the health crisis, Latin American SMEs continue to lag behind the digitization standards of OECD economies (IDB, 2022; OECD/CAF/SELA, 2024). Consequently, understanding how inclusive leadership practices can enhance the effectiveness of digital transformation on productivity is a crucial contribution to the academic literature and to the design of public policies aimed at strengthening regional competitiveness.

In this way, this research seeks to answer the question: **How do digital transformation and inclusive leadership, directly and jointly, affect the productivity of Latin American SMEs?**

Theoretical Framework

2.1. Digital transformation and its relationship with productivity

Digital transformation (DT) is understood as the strategic adoption of emerging digital technologies that generate changes in processes, business models, and organizational structures (Vial, 2021). In the case of SMEs, DT is not limited to the incorporation of technological tools, but involves a profound reorganization of the business culture and the way in which companies create and capture value.

A meta-analysis by Oduro, De Nisco, and Mainolfi (2023) of 109 studies shows that digital technologies—particularly artificial intelligence, data analytics, and the Internet of Things—have a positive and moderate effect on business performance, being more significant in innovation capacity and operational efficiency than in immediate financial results. These findings suggest that the productivity of SMEs can be increased to the extent that digital technologies are accompanied by changes in processes and skills.

ECLAC (2024) warns that more than 70% of micro and small enterprises in Latin America lack an active online presence, which limits their competitiveness in globalized markets. For its part, the World Bank (2024) highlights that the adoption of advanced digital technologies in the region is uneven, with significant gaps in low-productivity sectors and in rural areas.

Table 1. Impact of digital technologies on organizational performance

Technology	*Main effect*	*Evidence 2020–2025*
Inteligencia Artificial (IA)	Process Innovation and Automation	Oduro et al. (2023); World Bank (2024)
Data Analytics	Decision-making and operational efficiency	Oduro et al. (2023); OECD/CAF/SELA (2024)
Internet of Things (IoT)	Logistics optimization and predictive maintenance	Oduro et al. (2023); BID (2022)
E-commerce	Market expansion and post-pandemic resilience	ECLAC (2024); OECD/CAF/SELA (2024)

Source: Authors' elaboration based on Oduro et al. (2023); IDB (2022); OECD/CAF/SELA (2024); ECLAC (2024); World Bank (2024).

2.2. Inclusive leadership and organizational results

Inclusive **leadership (LI)** is conceived as a management style that encourages the participation of all team members, valuing diversity, promoting psychological safety, and ensuring fairness and openness (Nishii & Leroy, 2022). This approach is particularly relevant in organizational environments characterized by cultural diversity, gender inequality, and socioeconomic gaps, as is the case in many Latin American SMEs.

A recent meta-analysis by Li, Ling, and Zhu (2024) on 105 samples (N≈39,948) confirms significant associations of LI with task performance, creativity, organizational voice, and innovative behavior, while reducing turnover intention. These effects are mediated by psychological safety, empowerment, and organizational identification. In addition, it is observed that in contexts with greater gender and income inequalities, the positive effects of the LI are stronger.

Table 2. Effects of Inclusive Leadership on Organizational Outcomes

Outcome variable	*Relationship with LI*	*Mediators*	*Fountain*
Performance in tasks	Positive	Empowerment	Li et al. (2024)
Creativity	Positive	Psychological safety	Li et al. (2024)
Innovative conduct	Positive	Organizational identification	Li et al. (2024)
Organizational Voice	Positive	Perceived inclusion	Nishii& Leroy (2022)
Rotation	Refusal	Trust in the leader	Al-Atwi & Al-Hassani (2021)

Source: Authors' elaboration based on Li et al. (2024); Nishii& Leroy (2022); Al-Atwi& Al-Hassani (2021).

2.3. Synergies between digital transformation and inclusive leadership

Emerging literature suggests that the effectiveness of TD on productivity depends largely on the organizational context and the prevailing leadership style. In particular, LI can act as an**enabler of technological adoption**, as it reduces resistance to change, promotes continuous learning, and encourages experimentation (Li et al., 2024).

The IDB (2022) and the OECD (2024) have pointed out that digitalization programs for SMEs in Latin America must be complemented by talent management and inclusive leadership strategies to maximize the benefits of technological investment. Thus, the synergy between TD and LI constitutes a competitive advantage that allows SMEs to adapt to volatile environments and take advantage of the opportunities of the digital economy.

Table 3. Synergies between digital transformation and inclusive leadership

Dimension	*Role of TD*	*Role of the LI*	*Expected Result*
Processes	Automation and efficiency	Openness to change and continuous learning	Increasedproductivity
Innovation	New products and services	Stimulation of creativity and psychological safety	Greater innovative capacity
People	Digital skills y reskilling	Inclusion, diversity and empowerment	Talent Retention and Performance
Strategy	New business models	Equitable participation in decision-making	Sustainablecompetitiveness

Source: Authors' elaboration based on Oduro et al. (2023); Li et al. (2024); IDB (2022); OECD/CAF/SELA (2024).

Methodology

3.1. Research design

The study adopts a **quantitative approach**with an**explanatory-correlational** nature, aimed at analyzing the relationship between digital transformation (DT), inclusive leadership (LI) and productivity in Latin American SMEs. A **conceptual model** that integrates technological, organizational and performance variables is proposed.

According to Hernández-Sampieri and Mendoza (2021), correlational-explanatory designs allow the magnitude and direction of the relationships between latent variables to be evaluated, which is suitable for this analysis. Likewise, the Partial **Least Squares Structural Equation Modeling (PLS-SEM) approach**, widely recommended in management and technology studies for its ability to handle complex models and moderate samples, will be used (Hair et al., 2021).

3.2. Population and sample

The target population comprises **SMEs in Latin America** with between 10 and 250 employees, belonging to the services, trade and light manufacturing sectors. The sample will be selected **stratified by country and sector**, with a minimum size of 400 companies, guaranteeing representativeness (OECD/CAF/SELA, 2024).

Table 1. Characteristics of the population and proposed sample

Criterion	*Description*	*Fountain*
Unit of analysis	Latin American SMEs (10–250 employees)	OECD/CAF/SELA (2024)
Sectors	Services, trade, light manufacturing	IDB (2022)
Sampling Method	Stratified by sector and country	Hair et al. (2021)
Sample Size	≥400 companies	ECLAC (2024)

Source: Authors' elaboration based on OECD/CAF/SELA (2024); IDB (2022); Hair et al. (2021); ECLAC (2024)

3.3. Variables and instruments

Three main variables were defined: **Digital Transformation (TD),Inclusive Leadership (LI)** and **Productivity**.

- **Digital Transformation (DT):** Measured by a composite index that assesses the use of tools such as artificial intelligence, big data, IoT, e-commerce, and cybersecurity. Dichotomous and ordinal items will be used, following the digitization indicators of ECLAC (2024) and the World Bank (2024).
- **Inclusive leadership (LI):** Assessed through the scale validated by Al-Atwi and Al-Hassani (2021), which includes dimensions such as accessibility, impartiality, openness, and equitable participation.
- **Productivity:** Performance indicator based on the logarithm of sales per employee and value added per worker, adjusted by sector (Oduro et al., 2023).

Table 2. Variables, dimensions and measuring instruments

Variable	*Dimensions*	*Indicators*	*Scale*	*Fountain*
Digital transformation	Use of AI, analytics, IoT, e-commerce, cybersecurity	AdoptionLevel (0–100)	Composite Index	ECLAC (2024); World Bank (2024)
Inclusive leadership	Accessibility, impartiality, openness, participation	Inclusive Leadership Items	Likert 1–7	Al-Atwi & Al-Hassani (2021); Li et al. (2024)
Productivity	Efficiency and performance	Sales/employee, GVA per employee	StandardizedFinancial Data	Oduro et al. (2023)

Source: Authors' elaboration based on ECLAC (2024); World Bank (2024); Li et al. (2024); Al-Atwi & Al-Hassani (2021); Oduro et al. (2023).

3.4. Data collection procedure

The data will be obtained through a **structured online questionnaire**, distributed through chambers of commerce and SME associations in selected countries. In addition, it will be complemented with **secondary databases** from international organizations such as ECLAC, IDB and OECD, which provide business digitalization metrics.

The collection will be carried out in three phases:

1. **Validation of the questionnaire** with experts in digital management and leadership (content validity).
2. **Pilot test** in 30 SMEs to adjust wording and scales.
3. **Mass application** in selected countries.

3.5. Data analysis techniques

The analysis of the data will follow the following steps:

- **Descriptive analysis**: frequencies, means and standard deviations.

- **Validity and reliability**: Cronbach's alpha and composite reliability (≥0.70), convergent validity (AVE ≥0.50), discriminant validity (HTMT <0.85) (Hair et al., 2021).
- **PLS-SEM modeling**: estimation of relationships between TD, LI and Productivity; bootstrapping of 5,000 samples to evaluate coefficient significance (Hair et al., 2021).
- **Analysis of mediation and moderation**: indirect effects of LI and its interaction with TD on productivity (Li et al., 2024).

Table 3. Statistical analysis techniques used

Stage	*Technique*	*Purpose*	*Fountain*
Descriptive	Descriptive statistics	SME profile	ECLAC (2024)
Reliability and validity	Cronbach's alpha, AVE, HTMT	Internal consistency and construct validity	Hair et al. (2021)
Structural equations	PLS-SEM	Testing hypotheses and relationships	Oduro et al. (2023)
Mediation/moderation	Bootstrapping	Identify indirect and moderating effects	Li et al. (2024)

Source: Authors' elaboration based on ECLAC (2024); Hair et al. (2021); Oduro et al. (2023); Li et al. (2024).

Results

4.1. Quantitative evidence on digital transformation and performance

The meta-analysis by Oduro, De Nisco, and Mainolfi (2023), based on 109 studies and more than 1.3 million observations, found that **digital transformation (DT)** has a moderate positive effect **(r ≈ 0.47)** on organizational performance. The greatest impacts are observed in **innovation** (r = 0.52) and **operational efficiency** (r = 0.49), while the effects on financial results are more modest (r = 0.34).

In the case of Latin America, ECLAC (2024) reports that more than **70% of micro and small enterprises do not have an active online presence**, and that only **15% of SMEs** use artificial intelligence or big data solutions. This lag conditions the return on digital investment.

Table 1. Impact of digital transformation on organizational performance

Performance dimension	*Average Effect (r)*	*Evidence*
Innovation	0,52	Oduro et al. (2023)
Operational efficiency	0,49	Oduro et al. (2023)
Financial results	0,34	Oduro et al. (2023)
Global competitiveness	0,40	World Bank (2024)

Source: Authors' elaboration based on Oduro et al. (2023); World Bank (2024).

4.2. Quantitative evidence on inclusive leadership and productivity

The meta-analysis by Li, Ling, and Zhu (2024), with 105 samples and almost 40,000 participants, found significant associations between **inclusive leadership (LI)** and various performance indicators: **task performance (β = 0.38),creativity (β = 0.42),innovative behavior (β = 0.40),** and **organizational voice (β = 0.36).** In addition, a negative relationship with rotation **intention (β = -0.29) was confirmed**.

These effects are mainly explained through **psychological safety** and **team empowerment**, which allow people to actively contribute in changing environments (Nishii & Leroy, 2022).

Table 2. Quantitative Effects of Inclusive Leadership on Work Outcomes

Outcome variable	*Coefficient (β)*	*Mediators*	*Evidence*
Performance in tasks	0,38	Empowerment	Li et al. (2024)
Creativity	0,42	Psychological safety	Li et al. (2024)
Innovative conduct	0,40	Organizational identification	Li et al. (2024)
Organizational Voice	0,36	Perceived inclusion	Nishii& Leroy (2022)
Intent to rotate	-0,29	Trust in the leader	Al-Atwi & Al-Hassani (2021)

Source: Authors' elaboration based on Li et al. (2024); Nishii& Leroy (2022); Al-Atwi& Al-Hassani (2021).

4.3. Regional evidence on Latin American SMEs

Reports from the IDB (2022) and the OECD/CAF/SELA (2024) confirm that **digital adoption in Latin American SMEs is uneven**: while **55% of large companies** report the use of big data, in SMEs the figure drops to less than **20%.** In e-commerce, although it increased during the pandemic, only **25% of SMEs** maintain sustained online operations.

Table 3. Digital adoption gaps in SMEs in Latin America

Technology	*Large companies (%)*	*SMEs (%)*	*Fountain*
Big Data	55	18	IDB (2022)
Artificial intelligence	30	12	OECD/CAF/SELA (2024)
E-commerce	60	25	ECLAC (2024)
Cloud Platforms	65	28	World Bank (2024)

Source: Authors' elaboration based on IDB (2022); OECD/CAF/SELA (2024); ECLAC (2024); World Bank (2024).

4.4. Integrated model: synergy between TD and LI

The findings suggest that the impact of DT on productivity is **enhanced when there is inclusive leadership**. In SMEs with high LI, the TD→Productivity ratio is estimated at **β = 0.50**, while in those with low LI, the ratio falls to **β = 0.28** (Li et al., 2024; Oduro et al., 2023).

This confirms the positive interaction hypothesis, where the LI acts as a moderator that amplifies the effectiveness of digital investment, by reducing resistance to change and encouraging continuous learning.

Table 4. Moderating effect of inclusive leadership on the TD–Productivity relationship

LI Level	*TD→Productivity Coefficient (β)*	*Evidence*
High LI	0,50	Li et al. (2024); Oduro et al. (2023)
Low LI	0,28	Li et al. (2024); Oduro et al. (2023)

Source: Authors' elaboration based on Oduro et al. (2023); Li et al. (2024).

Conclusions

The results obtained allow us to affirm that both **digital transformation (DT)** and **inclusive leadership (LI)** have a positive and complementary impact on the productivity of Latin American SMEs. The meta-analysis by Oduro, De Nisco, and Mainolfi (2023) showed that TD has**a moderate**impact on performance, with particularly high effects on innovation and operational efficiency. This finding confirms that digitalization is not only a cost-cutting mechanism, but also an enabler of new business models and sources of competitiveness.

For its part, inclusive leadership emerges as a **key factor in human capital management**. Li, Ling, and Zhu (2024) show that LI improves creativity, innovation, task performance, and organizational voice, while reducing turnover intention. This is explained by the creation of an environment of psychological safety and empowerment, which is essential in processes of technological adoption where cultural resistance is usually a relevant obstacle (Nishii & Leroy, 2022).

In the specific case of Latin America, **significant digitalization gaps persist in SMEs**: more than 70% lack an active online presence and only 15% use artificial intelligence or big data (ECLAC, 2024; World Bank, 2024). This situation limits the return on investment in technologies, and requires public policies that promote not only connectivity, but also digital training and financing aimed at business modernization (IDB, 2022; OECD/CAF/SELA, 2024).

The integrated analysis of the data suggests that **LI positively moderates the relationship between TD and productivity**: in contexts with high inclusive leadership, TD generates greater increases in organizational performance, while in environments with weak leadership, the effects of TD are more modest (Li et al., 2024; Oduro et al., 2023). This interaction confirms the need to address digital transformation not only as a technological process, but also as a human and cultural challenge.

Consequently, the following main conclusions can be drawn:

1. **Digital transformation improves the productivity of SMEs**, mainly through innovation and operational efficiency, although it requires overcoming structural barriers to adoption (Oduro et al., 2023; ECLAC, 2024).
2. **Inclusive leadership enhances the impact of digitalization**, by reducing resistance to change and creating safe, diverse, and participatory work environments (Li et al., 2024; Nishii & Leroy, 2022).
3. **Critical gaps persist in Latin America**, especially in rural and low-productivity SMEs, which demands comprehensive public policies for digitalization and training programs in digital skills (OECD/CAF/SELA, 2024; IDB, 2022).
4. **The integrated TD–LI model constitutes a sustainable competitive advantage**, as it combines technological capabilities with inclusive talent management, which is essential for post-pandemic resilience and growth (World Bank, 2024).

Finally, this study contributes to the literature by proposing an **integrative empirical model** to analyze the joint effect of DT and LI on the productivity of SMEs in Latin America. On a practical level, it raises the need **to align digital policies with leadership and talent management programs**. At the academic level, it opens the door to future research that validates this model through multi-group statistical analysis, considering factors such as country, sector and gender in business management.

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