

# Digital Transformation in Latin America: A Systematic Literature Review between 2019-2023

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**Abstract** - The objective of this systematic review was to describe the bibliometric aspects and thematic axes regarding digital transformation in Latin America between 2019 and 2023. In this sense, a search was initiated in various scientific databases such as: Scielo, Redalyc and Scopus, using the following keywords: “digital transformation”, “digitalisation”, “digital knowledge” and “technology”. Subsequently, inclusion and exclusion criteria were applied corresponding to the presence of the study variable in the title, language, publication year, Open Access publication, type of research, quantitative results of the study, among other criteria. The bibliometric results showed that during 2019-2023, 19 studies related to digital transformation have been published, 84% of the identified studies have been published in Spanish and 16% in English, while Scielo is the database with the largest amount of research in this regard. In the case of thematic results, tools associated with digital transformation and correlation with other variables were identified. The most relevant findings show a positive effect on process automation, customer satisfaction and in the education and health sectors. Finally, it was concluded that digital transformation is having a positive impact on several Latin American organisations, but further empirical studies are needed.

**Index Terms** - alphabetical digital transformation, digitisation, Latin America, automation.

## INTRODUCTION

The modern world lives in a constant technological, economic, and social adaptation, especially due to the computer and computational progress initiated with the manufacture of the first microprocessor [1].

In present days, companies seek to adapt to new technologies in order to meet the standards of efficiency and productivity, so they look for the best strategies to generate greater profit. A specific example is the use of technologies such as the Internet of Things (IoT), Artificial Intelligence (AI) and Augmented Reality (AR) to improve the monitoring, control and automation of processes [2].

Digital transformation is a key process to achieve Industry 4.0 in any 21st century organisation, where companies seek to maximise efficiency, flexibility, and customisation in their operations through the use of advanced digital technologies. Such has been its growth that, in the last four decades, information technologies have brought about a revolution in various human activities [3].

Digital transformation is vital to migrate to Industry 4.0. The term Industry 4.0 emerged in 2011 in Germany as part of the strategy to boost the use of digital technologies in companies, to develop the economy from the generation and use of cyber-physical systems oriented to production [4]. On the other hand, Industry 4.0 is composed of a series of digital technologies that articulate and coordinate with each other for autonomous production through the interrelation between machines and people [5].

In this context, transformation refers to a moderate or major change in the daily tasks and operations of any organisation or institution, ranging from product and service conception and management to delivery. It is important to note that simply incorporating various technologies or tools does not guarantee a digital transformation; to achieve this goal, the organisation must make comprehensive and structural changes that leverage the potential of current technological advances [6].

COVID-19 intensified and accelerated the progress of digital transformation around the world, in human daily life, in the health sector, in education, in companies, etc., and, therefore, many changes were made to adapt to this new digital scenario [7].

**METHODOLOGY**

In the case of education, it was necessary to migrate to remote or virtual classes and companies had to adapt their sales processes through e-commerce strategies. Similarly, medical services had to use electronic means to carry out their operations: detection, monitoring, and care of medical cases during the pandemic. For example, in Cuba, geospatial technologies and mobile applications were used for interaction between the population and the Cuban health sector [8].

In Latin America, the pandemic took place in a late context of digital transformation for many countries, in spite of significant progress in the field. In Argentina, digital transformation can be seen in the significant increase in investment in internet advertising strategies, which is evidence of the trend towards the digitalisation of businesses. Between January and July 2016, it exceeded 1 billion Dollars [9]. In Colombia, it was possible to identify a weakness in the use of digital resources, especially in small and medium-sized enterprises [10], which have structural, financial, and competent human capital limitations that prevent them from developing in current software or computer environments.

In the case of Peru, companies have recently begun to consider digital transformation as a new way of generating value. In 2018, only 2% of companies were at a high level of digital transformation maturity; however, in 2019, 10% of companies are on this path, which reinforces the importance of digital transformation in business strategy. Likewise, the sectors that have reached digital maturity the most are telecommunications with 68.3%, and banking and insurance with 63.2%, due to the fact that their customers live in a digital environment and they have a better chance of reaching them if they have a digital platform [11].

However, in spite of the progress made in recent years, many organisations fail during digital transformation processes. One study mentions that almost 70% of companies that start a digital transformation stage do not manage to maintain their benefits in the medium or long term, mainly because they failed to implement deep organisational changes, suitable learning systems, or changes in the culture and mentality of employees [12].

In that sense, there is a need to explore how digital technology is changing the way businesses operate and how it is driving economic growth around the world. In addition, a discussion is required on some of the challenges and opportunities that businesses face in the process of digital transformation, and how they can overcome them to get the maximum benefit from this tool. Also, as technology continues to evolve at a rapid pace, it is important for companies to keep abreast of the latest trends and adapt so as not to be left behind.

Accordingly, the research sought to answer the following research question: What is known about digital transformation in 21st century organisations? In accordance with the established research question, the objective was to find out about bibliometric and thematic aspects of digital transformation in Latin America, based on a systematic literature review.

The purpose of this research is the elaboration of a systematic review, which comprises an exhaustive, protocolised, systematic and explicit evaluation of the literature based on a clear research question, a critical analysis according to the different tools used and a qualitative summary of the evidence of the study [13]. Systematic reviews are also a type of scientific research through which the scientific literature on a given topic is reviewed [14]. It begins with a clearly and objectively stated question, using methods to search, select and critically appraise research relevant to the stated question in a systematic and unambiguous manner, using systematic protocols to collect data and information from such research, then, to ensure purpose in users, it must contain the reason why and how it was done.

The study began with a preliminary search for selected studies using electronic search strategies [15]. Eligibility criteria were used; therefore, studies published in the relevant period of the research were considered, and research publications were selected at international, national, and local levels, in different languages, including theses, scientific articles and review articles. The search should include various databases and search engines [16], so the following were consulted: Scielo, Scopus, Google Scholar, Dialnet and Redalyc.

After the initial search, inclusion and exclusion criteria were applied. Ten criteria were established, as visualised in Table I, to exclude information that did not meet the parameters defined in systematic research from 2019 to 2023. We then proceeded to the selection of research publications at the international level. Regarding language, studies in both Spanish and English were considered. In addition, scientific articles were considered that contain as variables and keywords: “Digital transformation”, “Digitalisation”, among others.

**TABLE 1**  
**INCLUSION AND EXCLUSION CRITERIA FOR THE SYSTEMATIC REVIEW**

<b>Code</b>	<b>Description of the criterion</b>
C1	Title or abstract contains one or all the study variables
C2	Keywords are associated with the study variables
C3	Date of publication corresponds to the period established for the review
C4	The language of the study corresponds to the languages supported for the review
C5	The country of the research corresponds to the spatial delimitation of the review
C6	The study is available in full version
C7	The results of the study correspond to a correlational or applicative/empirical research of the studied sector
C8	The study applies tools associated with the variables
C9	The study is applied on an entity/organisation/company
C10	The study presents quantitative results or indicators that demonstrate a replicable effect or impact, as well as correlation with a variable

The process started with the selection of 531 research papers and 19 papers were finally included in the review. Subsequently, the following were selected for the presentation of results: name of the author(s), title of the research, country of publication, year of publication, keywords, language, and databases. With regard to the thematic axes, diagnostic tools, application tools and effects of digital transformation were identified.

**RESULTS**

The results were divided into two axes: a bibliometric one and a content one.

The bibliometric results allowed us to describe the selected studies while the content results allowed us to identify thematic aspects such as tools and findings of the results.

*3.1 Bibliometric Results*

In the bibliometric aspect, the study started by showing each of the research included in the systematic review. Table II shows the information considered: authors’ surnames and research titles.

**TABLE 2**  
**ARTICLES INCLUDED IN THE SYSTEMATIC REVIEW ON DIGITAL TRANSFORMATION IN LATIN AMERICA (2019 – 2023)**

<b>Authors</b>	<b>Research title</b>
Sánchez et al. [17]	Banco Caja Social: a case study of digital transformation to serve low-income markets
Granda, and Bermeo [18]	Transformación digital: propuesta metodológica para la automatización de procesos desde el enfoque del BPM
Townsend and Figueroa [19]	Los modelos de transformación digital en la gestión de las empresas comerciales
Londoño [20]	Estilos de liderazgo en los medios públicos ecuatorianos
Gómez, Alemán de la Garza and Hosman [21]	Uso de bibliotecas digitales solares para la enseñanza del cambio climático en comunidades rurales
Vidal et al. [22]	Salud y transformación digital
Calle, Torres and Tusa [23]	Las TICs, la enseñanza y la alfabetización digital de la familia
Sánchez et al. [24]	Estrategia de transformación digital para fortalecer el desempeño docente
De Agüero et al. [25]	Entre la desigualdad y la oportunidad: seguimiento a los retos educativos para la docencia durante la pandemia en la UNAM
Mejía and Mejía [26]	Transformación digital en las instituciones de educación superior a partir del Covid-19: madurez tecnológica de los estudiantes en Colombia
Lomas et al. [27]	Agronegocio de insumos agrícolas: Relación entre el comercio electrónico y la transformación digital
Fernández and Espinoza [28]	Sistema de información de intangibles y desarrollo organizacional para la transformación digital en la empresa cubana
Vargas [29]	La banca digital: Innovación tecnológica en la inclusión financiera en el Perú
Morales [30]	La transformación digital y la influencia de la inteligencia de negocios en las empresas del sector de turismo de reuniones en México.
Solís et al. [31]	Emprendimiento e innovación: Dimensiones para el estudio de las MiPymes de Azogues, Ecuador
Barros et al. [32]	Impacto de la transformación digital en la salud tropical
Castro, Delgado and Hernández [33]	Diagnóstico de transformación digital en hotelería: Caso de estudio en el Hotel Nacional de Cuba
Freire and Rodríguez [34]	The Transformation to an Online Course in Higher Education Results in Better Student Academic Performance
Sampedro et al. [35]	Transformación digital de la comercialización en las pequeñas y medianas empresas a través de redes sociales

*THE TITLES OF THE STUDIES ARE SHOWN CONSIDERING THE ORIGINAL LANGUAGE OF PUBLICATION*

Data collection was carried out based on the years of publication of each paper, as shown in Figure 1. Therefore, being a topic that has more relevance in recent years, relevant information was found between 2019 and 2023.

In that sense, it can be observed that during 2022 studies with significant findings regarding the implementation of digital transformation and its relationship with other variables have been published.

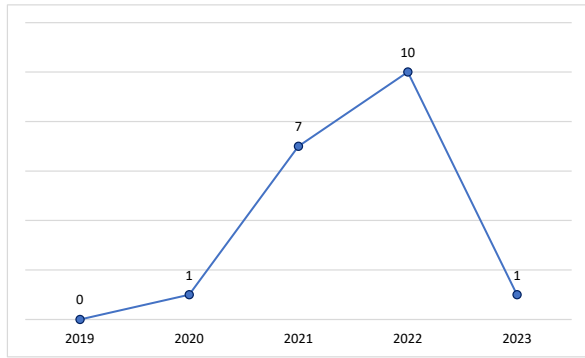


Figure 1. Quantitative Distribution Of Selected Articles According To Year Of Publication.

In addition, Figure 2 shows that the largest number of publications were found in studies carried out in Ecuador (7), Colombia (3) and Cuba (3). To a lesser extent, studies were collected in Peru, Bolivia and Uruguay.

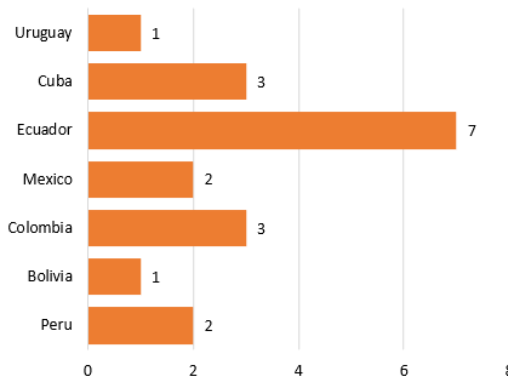


Figure. 2 Quantitative Distribution Of Selected Articles According To Country Of Origin

In Figure 3, it can be seen that 84% of the publications included in the review were published in Spanish, while only 16% were in English.

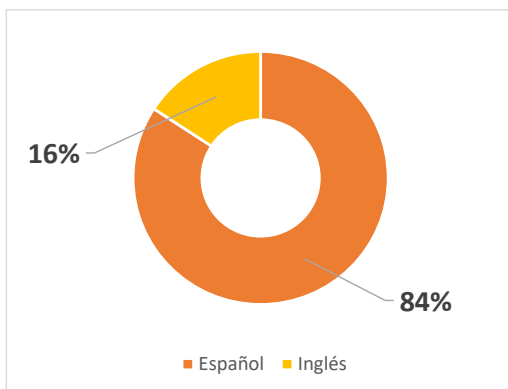


Figure. 3 Quantitative Distribution Of Selected Articles According To Language Of Publication

On the other hand, Figure 4 identifies “digital transformation” as the most frequent keyword in the collected articles. In the same way, “digitalisation” and “technological revolution” are mentioned as aspects associated with a digital transformation model, i.e. studies have focused their efforts on demonstrating that analogue or manual processes must evolve into digital procedures supported by information technology and computational advances.

In the same way, another important keyword is “technological maturity”, i.e. that organisations should establish a benchmark before initiating a digital transformation model in order to have a higher probability of success in the medium and long term, especially as many organisations neglect the need for a shift towards a digital culture and leadership.

The keywords also allowed us to identify that digital transformation is advancing significantly in the education sector as many studies cover variables such as: teaching, digital libraries, distance learning, educational innovation, among others.

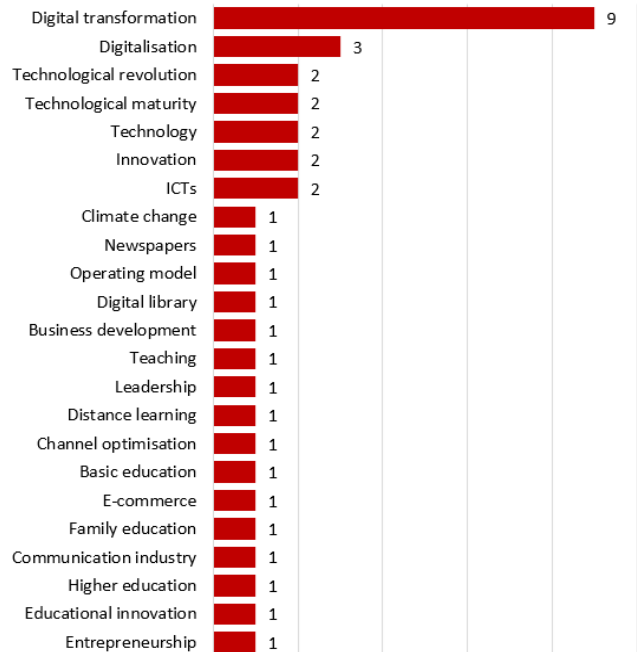


Figure. 4 Quantitative Distribution Of The Keywords That Make Up The Articles.

Similarly, the classification of the articles was considered according to the journals that published the studies. The Scientific Journal UISRAEL and the Journal Universidad y Sociedad can be identified as the journals with the highest number of empirical and descriptive publications on the implementation of digital transformation in organisations.



Figure 5 Quantitative Distribution Of The Selected Articles According To The Journal That Published The Studies

Likewise, Figure 6 shows the indexation of the journals mentioned above. It can be seen that most of the studies have been published in journals indexed in Scielo and to a lesser extent in Scopus.

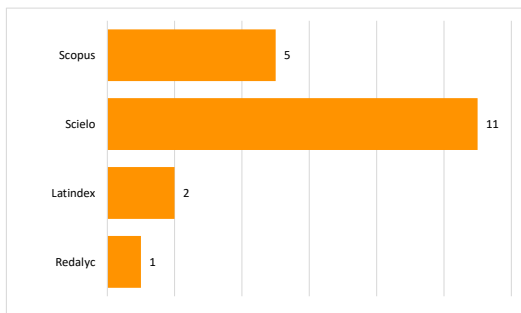


Figure. 6 Quantitative Distribution Of Selected Articles According To Indexation Of The Journals

Figure 7 shows the different affiliations corresponding to the main authors of each publication selected in the systematic review. It can be seen that the Technical University of Machala (Ecuador) has 2 publications where the correlation of digital transformation with family digital literacy and e-commerce is determined.

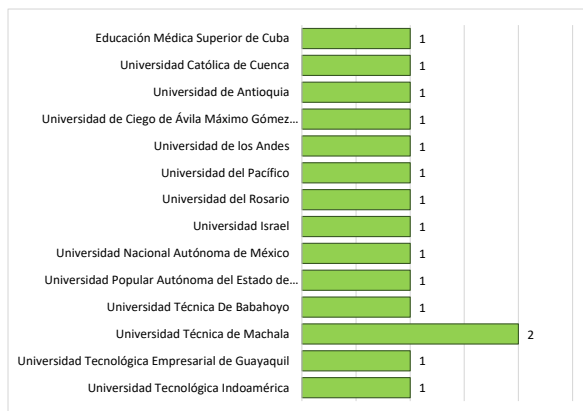


Figure. 7 Quantitative Distribution Of Selected Articles According To Affiliation Of The Journals

### 3.2 THEMATIC RESULTS

Table III details the tools mentioned in the various studies analysed in the systematic review. Seven studies did not apply or mention tools associated with digital transformation.

On the other hand, we were able to identify studies where tools involved in digital transformation models for organisations were mentioned. Business Process Management System (BPM): It is a set of tools and techniques used to design, model, implement and monitor business processes. BPM is used to improve the efficiency and effectiveness of business processes and to ensure that processes are aligned with the organisation's strategic objectives.

*MIT Center for Digital Business Model:* It is a model used to assess the digital maturity of an organisation. The model is based on five key dimensions: leadership and culture, digital capabilities, customer experience, digital operations, and digital business model.

*Digital libraries:* These are collections of digital resources that are used to store, organise, and share information. Digital libraries are used to improve access to information and to facilitate collaboration and knowledge sharing.

*Balanced Business Scorecard:* It is a strategic management framework used to align an organisation's strategic objectives with its business processes and resources. The framework is based on four key perspectives: financial, customer, internal processes, and learning and growth.

*Big Data:* It refers to extremely large data sets that are analysed for useful information. Big Data is used to improve business decision-making and to identify patterns and trends in data.

*Blockchain:* It is a distributed recording technology used to ensure security and transparency in business transactions. Blockchain is used to record transactions in a decentralised and secure network.

*Cloud Computing:* It refers to the delivery of computing services over the Internet. Cloud computing is used to improve operational efficiency and reduce the costs associated with maintaining local computing infrastructures.

*Artificial intelligence (AI):* It refers to computer systems that can perform tasks that normally require human intelligence, such as machine learning, speech recognition and decision making. AI is used to improve operational efficiency and to automate repetitive tasks.

*Mobile/internet banking:* It refers to banking services that are available via mobile devices or the internet. Mobile/internet banking is used to improve accessibility to banking services and to reduce costs associated with banking transactions.

*Strategic Meeting Management (SMM):* It is a set of tools and techniques used to plan, execute, and measure strategic meetings. SMM is used to improve the effectiveness of business meetings and to ensure that meetings are aligned with the organisation's strategic objectives.

*Information System for Health (IS4H)*: It is a computerised system used to manage health-related information. IS4H is used to improve access to health care and to improve the quality of health care.

*Forrester Digital Maturity Model (MMD 5.0)*: It is a model used to assess the digital maturity of an organisation. The model is based on five key dimensions: digital vision, digital strategy, digital customer experience, digital operations and culture.

*Remote online learning*: It refers to educational programmes that are available online. Remote online learning is used to improve access to education and to reduce the costs associated with face-to-face education.

*E-commerce*: It refers to commercial transactions that take place online. E-commerce is used to improve access to products and services.

The descriptive category has 7 findings, the correlational category has 4 findings and the optimisation category has 15 findings. The findings of the optimisation category include process automation, increase in customer satisfaction, positioning against competition, improvement in data management, improvement in innovation processes, quality in education, quality in health, organisational culture oriented towards digitalisation and digital disruption and change in the business model. The correlational category includes digital transformation and teaching (1), digital transformation and e-commerce (2) and digital transformation and academic performance (1). The descriptive category includes business modelling (1), educational quality (1), health quality (1), teaching and literacy (1), measuring technological maturity (1), implementing information systems (1) and improving leadership style (1).

In the case of process automation, it is a common outcome of digital transformation in organisations. Process automation involves the use of technology to perform tasks that were previously done manually. This can include the automation of administrative tasks, such as invoice management and payroll management. Process automation can also improve the efficiency and quality of work by reducing human error and increasing the speed and accuracy of work.

Increased customer satisfaction has been another significant finding of digital transformation associated with the business sector. Digital transformation can improve the customer experience by providing a more personalised and efficient experience.

Likewise, an improved customer service experience can strengthen positioning against competition. Digital transformation can help organisations stay competitive by enabling them to innovate and adapt quickly to changes in the market.

Improved data management is also an important benefit of implementing a digital transformation model. Digital transformation can improve data management by enabling better collection, analysis, and use of data to make more informed business decisions.

If organisations achieve a proper implementation of digital transformation, in the medium to long term, it would result in an improvement in innovation processes. Digital transformation can improve innovation processes by enabling greater collaboration and communication between teams and more experimentation with new ideas.

**TABLE 3**  
TOOLS ASSOCIATED WITH DIGITAL TRANSFORMATION ACCORDING TO THE SYSTEMATIC REVIEW STUDIES

Tools	Mention in studies
No engineering tools applied	7
Business Process Management System	1
MIT Center for Digital Business Model	1
Digital libraries	1
Balanced Business Scorecard	1
Big Data	2
Blockchain	1
Cloud Computing	1
Artificial intelligence	1
Mobile/internet banking	1
Strategic Meeting Management	1
Information System for Health (IS4H)	1
Forrester Digital Maturity Model (MMD 5.0)	1
Remote online learning	1
E-commerce:	1
Social networks	1

Table IV shows the main findings or results identified in the studies. The findings were classified into three categories: descriptive, correlational and optimisation.



**TABLE 4**  
**MAIN FINDINGS OR RESULTS OF THE STUDIES COMPILED IN THE**  
**SYSTEMATIC REVIEW**

Classification of Findings or Results	Mention in studies
<b>Optimisation</b>	<b>15</b>
Process automation	3
Increase in customer satisfaction	4
Positioning against competition	1
Improvement in data management	1
Improvement in innovation processes	1
Quality in education	2
Quality in health	1
Organisational culture oriented towards digitalisation	1
Digital disruption and change in the business model	1
<b>Correlational</b>	<b>4</b>
Digital transformation and education	1
Digital transformation and e-commerce	2
Digital transformation and academic performance	1
<b>Descriptive</b>	<b>7</b>
Business modelling	1
Quality in education	1
Quality in health	1
Education and literacy	1
Measurement of technological maturity	1
Implementation of information systems	1
Improvement in leadership style	1

**CONCLUSIONS**

The systematic review of the literature on digital transformation in Latin America during 2019 to 2023 demonstrates its relevance in today's globalised world. Digital transformation is profoundly impacting various aspects of society, the economy and everyday life as it is enabling the harnessing of digital technologies to improve and optimise processes, products and services in all areas of an organisation or society.

The bibliometric results allowed us to conclude that empirical and descriptive research on digital transformation has increased since 2020, mainly in Spanish (84%) and with a higher incidence in the Scielo database. It was also possible to conclude that many advances are taking place in the financial, health and education sectors and in those organisations oriented towards customer service.

The thematic axes analysed have also led to the conclusion that several Latin American organisations have taken advantage of digital transformation models to boost innovation, improve competitiveness, optimise processes, improve customer experience and sustainability in the market.

Finally, it is recommended that future research on the topic should expand the sources of information collection to make quantitative and empirical results more readily available.

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