DIGITAL TRANSFORMATION AND BUSINESS DEVELOPMENT CENTERS: LITERATURE REVIEW, QUALITATIVE AND QUANTITATIVE ANALYSIS

TRANSFORMACIÓN DIGITAL Y CENTROS DE DESARROLLO EMPRESARIAL: REVISIÓN BIBLIOGRÁFICA, ANÁLISIS CUALITATIVO Y CUANTITATIVO

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Abstract

This paper is focused on summarizing the results of Digital Transformation impact over the economy, its digital ecosystem and the contribution of the Business Development Centers to SMEs and MSMEs (Micro, Small and Medium Enterprises). A statistical contrast of the connectivity data, digitalization of production, gross sales of the digital ecosystem is shown and analyzed. Likewise, the traceability and adoption of the North American Small Business Development Center (SBDC) model is outlined in order to get a better understanding of current Colombian scenarios. Main results include aspects of this subject, conceptualizing historically and regulatory the main aspects of this subject, having references such as: Development Bank of Latin America – (former CAF), the Organization for Economic Cooperation and Development – OECD and United Nations - UN, among others, in order to give a real state of the art of those specific subjects in several regions word-wide.

Keywords: Business Development Centers (BDC), Digital Ecosystem, Digital Transformation, Micro, Small and Medium Enterprises (MSMEs), Small Business Development Center (SBDC).

Resumen

Este artículo se enfoca en los resultados del impacto de la Transformación Digital en la economía, su ecosistema digital y la contribución de los Centros de Desarrollo Empresarial (CDE) a las MiPymes. Se realiza un contraste estadístico con los datos de conectividad, digitalización de la producción, ventas brutas dentro del ecosistema digital y análisis de productos de alta tecnología. Del mismo modo, se resume la trazabilidad y adopción del modelo norteamericano de Centros de

Recepción: Agosto de 2021 / Evaluación: Septiembre 2021 / Aprobado: Octubre 2021

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Desarrollo Empresarial (SBDC) con el fin de tener un mejor entendimiento de los escenarios en Colombia. Los resultados principales incluyen análisis cualitativos y cuantitativos que conceptualizan la historia y regulación acerca del tema, teniendo en cuenta referencias como: El Banco de Desarrollo de América Latina - CAF, La Organización para la Cooperación y el Desarrollo Económicos de América Latina – OECD y las Naciones Unidas - UN, entre otros; buscando evidenciar el estado del arte de los temas específicos de estudio.

Palabras clave: Centros de Desarrollo Empresarial (CDEs), Ecosistema Digital, Micros Pequeñas y Medianas Empresas (MiPymes), Transformación Digital.

Introducción

Technology has played an important role in globalization processes focused on problem solving, meeting and fulfilling the expectations of today's society (Meller & Parodi, 2017), Global economic development uses technology as a means to strengthen integration channels between organizations of multiple origins, sizes and sectors of the economy. The economic, political-social, and technological dynamism have made necessary the generation of government policies that allow the market development, generating new commercial channels between nations, focused on Micro, Medium and Small Enterprises (MSMEs). As a consequence, the need arises to promote the economy through business models and digital ecosystems in order to favor the geographically and economically disadvantaged sectors.

Location, size and culture diversity of emerging companies represents an obvious challenge, which is faced by government entities according to their technological and political limitations. In response, digital and economic ecosystems have been consolidated, systemically related to the organizations internal development (Juca Maldonado & Jaramillo Matute, 2019), through disruptive technologies, information systems and distributed models. The construction of these ecosystems strengthens the value that these entrepreneurs and small businessmen offer to the market, adopting technological tools as an essential part of their DNA, (RICOH, 2020). There are some strategies that promote economic growth creating a network of Small Business Development Centers (SBDC). In Colombia the support for these initiatives comes from The Ministry of Information and Communication Technologies (MinTIC) (MinTIC, 2020), and The Ministry of Commerce Industry and Tourism (MinCIT) (MinCIT, 2020a), these government entities enhance learning, innovation and transformation processes. The main goal of this effort is oriented to a better understanding of digital transformation and the processes and policies in order to support new companies in the middle of new International models. Literature review of these topics and its analysis is intended to be the basis for future models where company growing, especially in Colombian scenarios, together with the use of the technology necessary to succeed in this new era of globalization of business and digital economy (MinTIC, 2016).

For the above, the paper is structured as follows. Initially, methodology is presented, followed by a context study on economic-digital ecosystems, and the Small Business Development Center model; then a quantitative and qualitative analysis of digital transformation in Latin America and the Caribbean is presented, finally, strategies to strengthen the ICT apparatus are outlined.

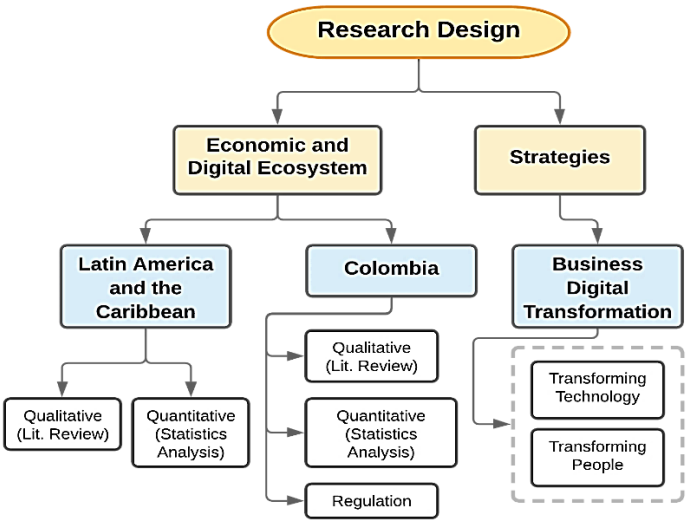
Methodology

The methodological approach corresponds to an exploratory type of research with qualitative and quantitative elements, where a documentary study is conducted to establish a baseline on: *Digital Transformation* (DT), *Economic Ecosystems* (EE), *regulations, and Business Development*

Centers (BDC). These provide research elements regarding the adoption of disruptive technologies by organizations and the impact of the SBDC model.

Categorization was used as an identifying method based on a general index, (Hernández Sampieri et al., 2014), specifying three categories: *economic and digital ecosystems*, and *strategies*; as subcategories: *Latin American regional context*, *Colombian context*, and *digital transformation businesses*, Fig.1. In addition, national and international governmental sources (OECD, 2019a), (The Economic Commission for Latin America, 2014), such as United Nations - UN, among others, are taken into account. Data is collected for the period between 2013 and 2020.

Figure 1. Pathway and scope to the first phase of current research. Source: Own elaboration



Digital transformation

Use of technology tools has transformed the user activities within MSMEs, as well as the processes that relate them to their customers. The systematization of operational, tactical and strategic processes in many economic and productive sectors, use emerging technologies in commercial environments as a competitive advantage in the face of a constant economic, social, political, environmental and cultural society dynamism. This has allowed new corporate strategies to emerge every day with the objective of providing solutions to paradigms, developing new products and services, where market disruption involves Information and Communication Technologies (ICT) in MSMEs, (Kretschmer & Khashabi, 2020).

In the above sense, DT is defined as an adoption process, quick and widespread application of digital technologies in economic environments, (Kretschmer & Khashabi, 2020); another position introduced by (OECD, 2019c) and (Agarwal, 2020) define it as a fundamental change of an organization in business strategies, its model, tactics, operations that are built and developed around the power of digital technologies. However, for (Baiyere et al., 2020) DT is based on value assumptions, seeking to improve the efficiency and quality of organizational processes in a business context characterized by uncertainty and a constant flow of changes; for the Colombian Ministry of Information and Communication Technologies (MinTIC) this concept is conceived as: *"... the use and appropriation of information technologies, combined with leadership capacity and organizational change, to modify and improve the performance and the business model of*

companies and sectors..." (Curbelo, 2017), (MinTIC, Rengifo, et al., 2020) Thus, it is based on the existence of DT in which connectivity, the impact on products, services and people are part of the adoption of ICTs, allowing to generate organizational and structural changes in order to plan, design and implement effective and updated strategies.

Features

DT is defined in terms of the elements that ensure that existing or new policies are in line with the digital economy and society; these are related, providing differential and reinforcing effects on implemented policies, as defined below, (MinTIC, Abuchaibe, et al., 2020).

1. **Massless scale.** A situation where a company uses technological tools and scales quickly, offering digital services with great impact on the world.
2. **Panoramic scope.** Digitization enables companies to expand their reach by making use of the ability to combine, process and integrate digital resources into different products.
3. **Speed.** Digital technologies accelerate relationships, generating economic and social opportunities; this speed may lead to an increase in the value of existing data, making it more accessible and reusable.
4. **Intangible capital and new ways of value creation**. Information and data flow enable the development and enhancement of capital goods services.
5. **Spatial transformation**. Ease of converting physical elements and taking them to a digital environment, obtaining a real value equal to or greater than those defined in the physical environment, reducing geographical limitations, improving the relationships that used to play in production, trade and consumption.
6. **Peripheral strengthening.** Digital technologies optimize network capacity by expanding markets and their communities.
7. **Platforms and ecosystems.** Digital intermediation enables content distribution and storage, generating centralized flows and turning information into a strategic asset and a competitive advantage.

Taking into account the above elements, for the Americas and the Caribbean, DT is considered as a tool that can increase productivity and help narrow the gaps in countries' development processes. From this perspective, the generation of public policies that promote this transformation and productive improvement processes through new technologies is becoming increasingly relevant. The reduction of digital gaps and the generation of programs that allow access and stability of broadband channels provide greater scope to digital transformation; ensuring the inclusion of communities and their processes in strengthening the technological diffusion of business models, while establishing integrated digitalization processes, (Curbelo, 2017).

In addition, it is important to encourage capital injection in areas such as machinery and equipment; however, it is important to highlight the investment needed in new technologies, training, IT governance, business architecture, as well as working skills, organizational changes, process innovation, intellectual property, research, development, new systems and business models, and government policies. The strategies related to these topics promote change processes and should be aimed at facilitating the entry, growth and results in companies; ensuring healthy competition, as well as regulations that encourage MSMEs and generate productive ideas to participate in digital transformation. Making use of comprehensive digital strategies that take into account all economic areas of the country, such as the BDC, knowledge and skills networks,

financing policies, among others (Blumel Mac-Iver & Ministerio Secretaria General de la Presidencia, 2018), (OECD, 2019b).

As a result, the environment requires a proper development process of basic and specialized skills to deal with the change management, the learning of ICT competencies in people and the integration of traditional trade with digital and electronic commerce, overcoming common trade barriers and adjusting economic policies to the new challenges. In the same way, the necessary skills should be encouraged to strengthen cooperation between national entities that manage the digitization processes, so that they understand the global context and ongoing changes in the world in terms of digital economy, (Guenzi & Habel, 2020).

Digital divides

Digital technological progress reveals the lack of infrastructure necessary for its massification, only half of the world's population is connected to Internet networks (OECD, 2019c), generating a gap between the *connected* population and those who are not. In countries such as Colombia, the adoption of digital technologies differs by age, educational level, proximity to major cities and purchasing power, these gaps have been closed over time in some countries, as indicated by the OECD in its document *Profiling DT in Latin America and the Caribbean of 2019*, (OECD et al., 2019).

Digital access gaps can be filled through the implementation of effective new business models aimed at ensuring access to Internet and digital services in line with development policies.

In other words: DT does not only refer to the adoption of digital technologies, it is related to the change in society's attitude towards its use, turning technology into an opportunity for economic and social improvement. In this transformation, data are fundamental, nevertheless, there are many more variables; gathering, flow, processing and manipulation of information drive innovation and create value becoming an additional asset in organizations, (Hernández Hernández & Camelo Posada, 2019).

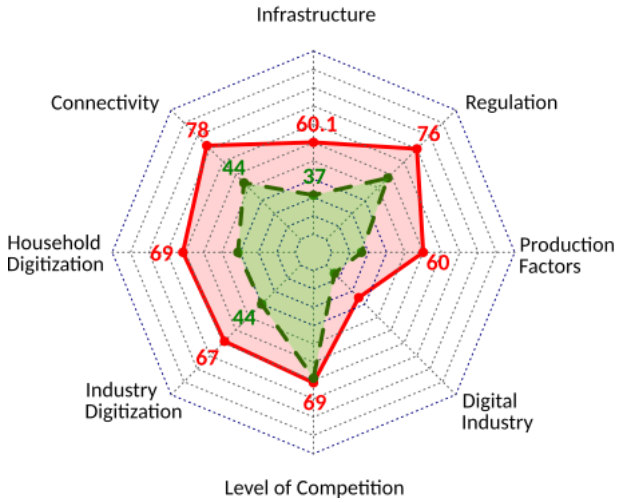
Quantitative status

DT has been having an adaptive process in SMEs and MSMEs in countries in Africa, Latin America and the Caribbean, Asia and Europe; according to the Development Bank of Latin America (former CAF) in its 2017 report, the comparison of statistics from 2004 and 2015 show connectivity rates, household digitization, regional industry digitization, in OECD countries, China and India, quantifying access to technologies and services such as computers, smartphones, internet access, e-commerce, digital channels, in households and industry. There are data on gross sales of digital ecosystem, gross revenues from digital advertising, high-tech product and service exports, and digital advertising revenues, allowing to contrast the productive apparatus and digital ecosystem against the economic weight in the region. Due to the above, it is appropriate to say that in Latin America and the Caribbean (LAC) there is an increase of 40.06% of digitization, in terms of internet access in households in 2005 of 14.36%, increasing the population percentage in network access by 54.42% in 2015. Similar case is shown in the digitization of internet access production in commercial establishments, which during 2005 was 64.57% and in 2015 reached 87.94%, increasing connectivity in SMEs and MSMEs by 23.37%. It is worth noting that in 2005 mobile broadband was 0.91% and in 2015 it was 57.41%, increasing by 56.5%, the development of digital industries established a growing impact on economic development, (Advisory Services LLC, 2017), (CAF et al., 2020) (CAF, 2020).

According to CAF, a sample of 150 countries was taken, where the digitization index increased by 10%, Gross Domestic Product (GDP) per capita increased by 0.75% and GDP of OECD countries increased by 2.42%. In other words, digitization growth reflects the return of scale and impact on economic growth, accelerating as the digital and economic ecosystem grows; according to statistics the influence coefficient of digitization is significantly higher than the influence coefficient of ICTs, likewise, the penetration of broadband or mobile telephony. However, economic impact is maximized through implementation of public regulations that embrace telecommunications, Internet use, information technology, and even business innovation, (OECD, 2019c), (Advisory Services LLC, 2017).

It is important to highlight the competition levels registered in comparison between LAC and the OECD, showing that there are outstanding factors in the ecosystem, its development and subsequent analysis, linking the following indicators: infrastructure, connectivity, household digitization, production digitization, digital industries, production factors, competition, institutional and regulatory, (OECD et al., 2019). In effect: it means that public policies and resources allocated to these pillars have a positive impact on the entire digital ecosystem and at the same time allows to highlight weaknesses in digital industries and production factors. Clearly, the production digitization is affected by the development of infrastructure and digital industries, as well as the increasing demand for household digitization, for this purpose an indicator or growth rate is established as an exponential increase in 2015, (OECD, 2017), (OECD, 2017), see figure 2.

Figure 2. Indicators on digital transformation OECD vs LAC. Own elaboration



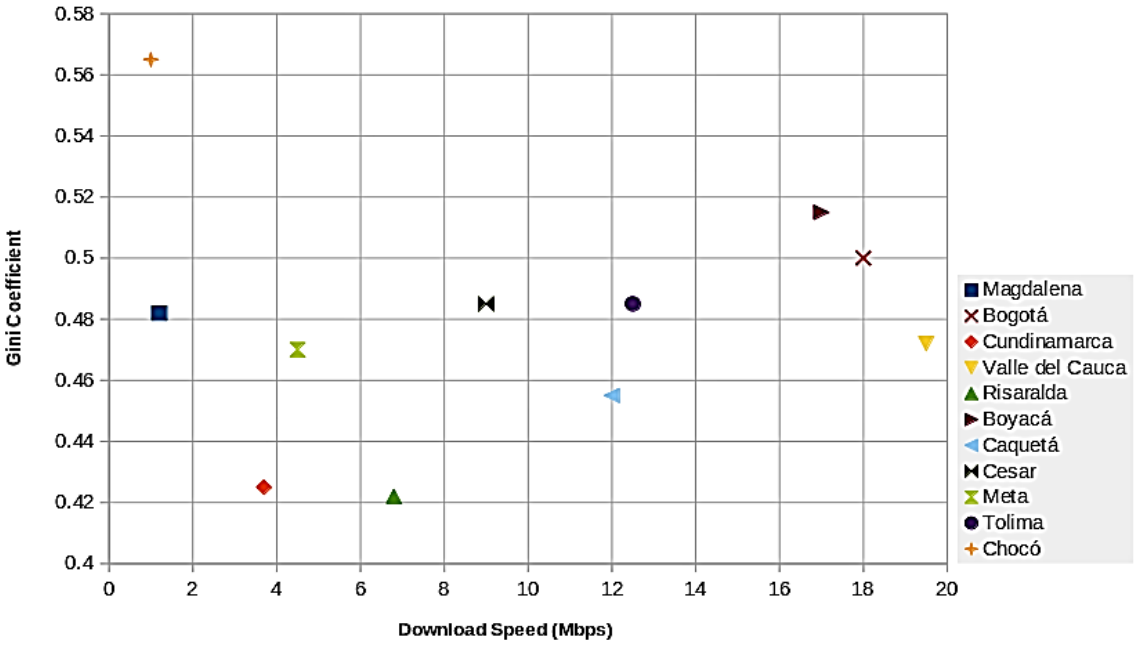
The eight indicators shown below in the network diagram illustrate the identified time range status in order to understand how support policies can be projected for each of them.

The Colombian case

Colombia, a CAF and OECD member country, has transformed its technological ecosystem in recent years. For example, the average internet speed in households by state in 2018, which is performed with respect to GINI coefficient that calculates levels of income equity or inequality, the measurement scale comprises a numerical interval between zero (0) and one (1), where zero (0) corresponds to perfect equality (everyone has the same income) and where the value one (1) corresponds to perfect inequality (one person has all the income and the others have none). Gini

coefficient contrasts the average speed measured in Megabits per second (Mbps) in the states, (Garzón et al., 2019), (Pinto et al., 2016). Figure 3 indicates that in states such as Chocó and Magdalena there is a higher level of inequality, and in Valle del Cauca and Bogotá, network speed improves equity levels. According to Cisco estimates, traffic has increased from 100 GB per day in 1992 to 20,235 GB by 2015, it is estimated that the amount of data per second will reach 61,386 GB in 2020, which means that connectivity in Colombian SMEs and MSMEs is expected to increase significantly in relation to previous years (MinTIC, Rengifo, et al., 2020), (DANE, 2020) , (CISCO, 2016).

Figure 3. Download speed ratio and Gini coefficient by state. Source: Own elaboration



Regarding infrastructure in the Colombian context, a digital ecosystem has been developed in the country, which consists of several elements directly related to services, inputs, infrastructure, telecommunication services and interfaces. Within the regulatory and social framework are included formal guidelines and institutions that allow the functioning of this digital ecosystem by categories, Fig. 4, (MinCIT, 2020a), (CAF et al., 2020) (CAF, 2013).

The first category involves the following elements:

- **Supplies.**

Consists of those assets required for service provision and that are consumed throughout the service production or provision process.

- **Infrastructure.**

Refers to the network's physical and active device components through which ICT services are provided.

- **Communication services.**

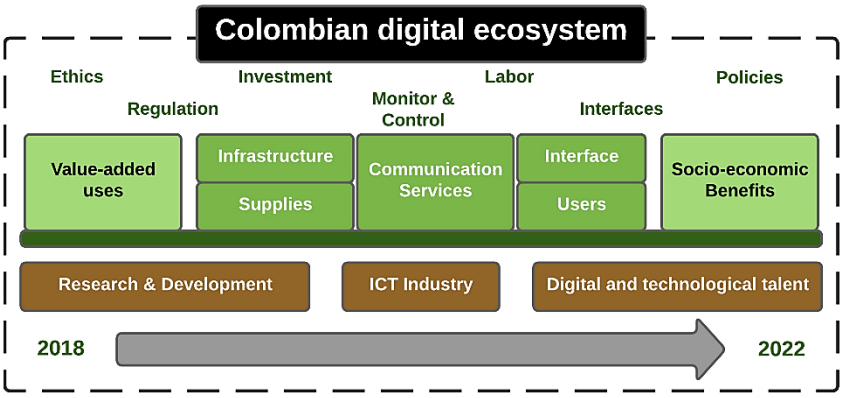
Includes all Internet, telephone, television and postal services, as well as services provided directly through the infrastructure component.

- **Interface.**

Refers to devices through which people access information and communication technologies.

The second category includes the ICT Industry, Digital and Technological Talent, Research and Development. These are communications and connectivity services that add value to economic activities and the digital ecosystem, where users, human resources, organizations and others are located, see figure 4 (MinTIC, Rengifo, et al., 2020), (MinTIC, Abuchaibe, et al., 2020)

Figure 4. Colombian Digital Ecosystem. ICT Plan 2018-2022. Source: Own elaboration



Business Development Centers - BDC

Since the rise of the fourth industrial revolution, companies have addressed productive policies through processes associated with Digital Transformation, which has accelerated the transition of innovation towards tools and methodologies that improve competitiveness and economic growth of organizations; these characteristics are integrated in the SBDCs. These centers have had a very special welcome in LAC countries, thanks to The United States SBDCs shared experience, (WEF, 2020). The current context of SBDCs in Africa, Asia and Europe, as well as in some LAC countries, is presented below.

Africa. Nowadays, the African continent is implementing programs for best practices in the use and exploitation of technologies in order to generate and promote productive projects in key sectors of their countries' economies. The European Union (EU), Russian and Chinese governments have stimulated cooperation and development policies for vulnerable sectors in the African region through ICT contribution programs for agriculture, climate change adaptation, education, financial services, government services and health. Different methodologies are used in the development of these projects due to demographic, geographic, economic and ICT infrastructure conditions, (BIRF - AIF, 2016) .

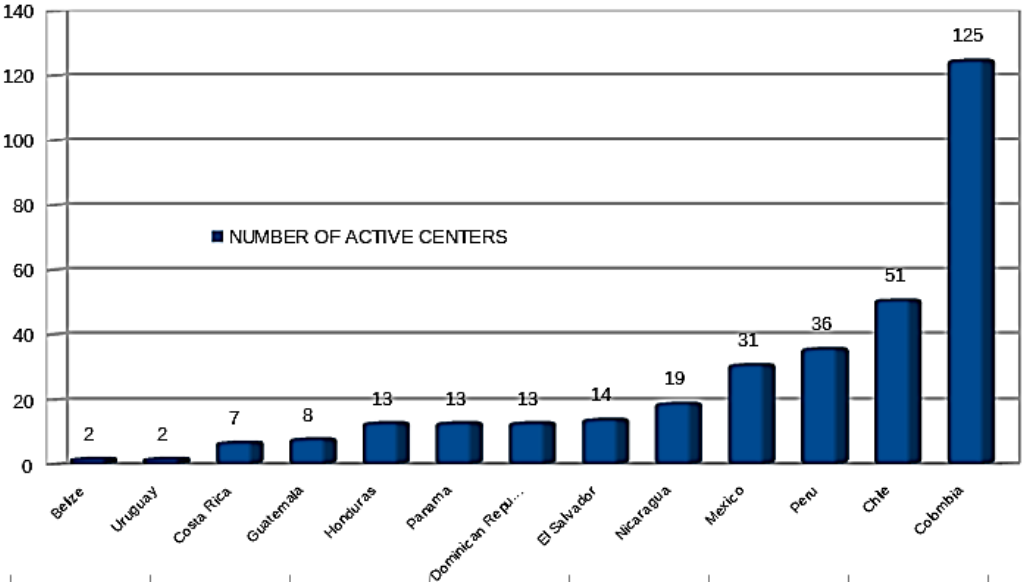
Asia. The most important success stories in terms of the adoption of ICT policies and promotion strategies can be seen in Asia. In countries such as South Korea, China, Japan and Singapore, economic development policies for MSMEs are based on strong state interventionism, large business holdings and massive technology acquisition. The Asian belt is still a reference for its economic status and well-defined economic strategies that keep it at the forefront of the world economy. At present, these governments are carrying out programs to promote the growth in developing countries, enhancing the new ICT strategies by providing infrastructure and training for productive proposals based on technology, (West, 2018)

Europe. In Europe, support for business innovation is provided through the *Enterprise Europe Network* program developed by the European Union. The aim of this program is to help

companies to incorporate innovative ideas for commercial success in international markets. Innovation support services are open to all types of companies. The European Union, through its economic cooperation plan, sponsors programs in Africa, America and Asia for developing countries to implement innovation policies based on ICT strategies, (Euphorianet, 2020), (EU, 2020).

Latin America. A problem in policy implementation to help economic and productive sectors is the lack of communication strategies between government agencies and the entities in charge of their promotion, generating dispersion and a decrease in results, (Autoridad de la Micro Pequeña y Mediana Empresa, 2017), (CONAMIPYME, 2017), (CONAMIPYME, 2019), (OECD & CAF Development Bank of Latin America, 2019), Fig.5.

Figure 5. Small Business Development Centers by country. Source: Own elaboration



Colombia. BDCs are sponsored by the Ministry of Commerce, Industry and Tourism (MinCIT), starting in 2013 with 9 points, (IMF, 2020); and by 2018, significantly expanding coverage with 20 new ones, covering all 32 departments of the country, (States et al., 2012). SENA has been the pioneer of the BDC program in the Country (Innpulsa Colombia et al., s/f)

As a result, the MinCIT -with its programs aimed at MSMEs-, the National Learning Service (SENA) -with its National Coordination of Entrepreneurship-, and Innpulsa Colombia (MinCIT, 2018), (MinCIT, 2014), have promoted entrepreneurship and innovation and business growth to strengthen the productivity and competitiveness of companies in Colombia (Fiducoldex & Innpulsa Colombia, 2020), (Emprender, 2019). In addition, monitoring and control of compliance with BCD program goals and objectives has been carried out by organizing and structuring work teams, decentralizing the budget, reviewing strategic alliances and agreements, and establishing guidelines and responsibilities for the execution of each program, (Cortés & Cortez, 2018, p. Propuesta de Fortalecimiento para los Centros de Desarrollo Empresarial (CDE) de la Región Central del Valle del Cauca), (MinCIT & Innpulsa Colombia, 2020).

Normativity

In Colombia, legal support for business development was established at the end of 1970s, (Ley 67 de 1979, 1979). The general legal framework is based on Law 590 of 2000 -through 47 articles- and *...Whereby provisions are issued to promote the development of micro, small and medium-sized enterprises*, (Ley 590 de 2000, 2000) . Subsequently, in 2004, Law 905 strengthened support for MSMEs by integrating the plans that would later be developed by the several Ministries (Ley 905 de 2004, 2004). In order to provide a regulatory framework for entrepreneurship culture in the development model, mechanisms were established in 2006 through law 1014, (LEY 1014 DE 2006, 2006), (Conpes 3975, 2019). Up to this point entrepreneurship and company creation had been executed without taking into account technology as a way and means of many of the production or commercialization processes; it is then when technology, science and innovation are taken into account giving step to SPIN-OFF model structuring where entrepreneurship, technology and academia are connected, aiming to strengthen the economy from early stages in the productive environment; and in 2017 Higher Education Institutions are involved in the change of economic paradigm through Law 1838, (CONPES 4011, 2020). Recently, in this sense, the efforts of technological development, entrepreneurship and knowledge were coordinated with the aim of strengthening Colombia's economy through the creation of the Ministry of Science, Technology and Innovation (MinCiencias), (Ley 1838 de 2017, 2017),

Recommendations

The need for technology in business development is evident, from the analysis of needs and the structuring of efficient and lasting solutions to model construction and maturity, contributing to economic and technological development in the country.

It is suggested the generation of integration strategies between countries where knowledge in SBDC international model implementation is shared, as well as Colombian experience with BDCs, thus generating initiatives and ideas that strengthen the economic and digital ecosystems of companies, (MinCIT, 2020b), (MinTIC, 2019). Likewise, it is suggested to evaluate, adapt and integrate other types of project management models involving DT that are beneficial for the Latin American economic model.

Conclusion

Technology and its benefits depend on the effort and articulation of different stakeholders: entrepreneurs, innovators, technology generators, analysts, business model creators, investment funds, angel investors, venture capitalists, mentors, coaching generators, academia as an incubator of ideas, and the government through its ministries. Only through structured thinking that takes market opportunities, exploits possibilities of exporting services instead of exporting talent, maintains an active development of entrepreneurial thinking and navigates within the legal framework, plans and incentives for the academy as a seedbed, and the new industry as a recipient can be materialized; using technology at the service of the development of innovative ideas that positively impact a digital ecosystem, from the idea to the economic impact that positively impacts the entrepreneur and the national stability. The development of SBDC centers in Colombia with DT processes understanding in all its components (hardware, software, human talent and digital culture) will be the protagonist in the short term, becoming a milestone in digital development path of the country.

Economic-digital ecosystem governance is not a simple task, given the difficulty of keeping each systematic component stable, taking into account the presence of new needs that make their dynamism evident. These must be highly resilient, flexible and scalable to a changing economy,

being adaptive to disruptive technologies; allowing the generation of efficient and effective management models.

This requires clear public-private investment policies that allow the generation of new economic and international cooperation channels, as well as the establishment of digital trade agreements and business training.

It can be stated that Digital Transformation is fundamental in economic and digital ecosystems development, where adoption of disruptive technologies strengthens the value chain of organizations. Likewise, it develops and enhances the skills and processes of MSMEs, achieving a quick market positioning, reducing the probability of failure as a company.

Colombia is a regional benchmark for business Digital Transformation due to its public policies in entrepreneurship and support to MSMEs. Thanks to the promotion of programs for business growth through ICT initiatives such as Business Development Centers, which have materialized government strategies for sustainable economic development.

Moreover, Latin America and the Caribbean's economy has grown significantly in the last decade, positioning the region at advanced and competitive levels regarding Asia and Africa. However, a greater political, social, regulatory and economic effort is required to develop new technologies. This may lead to a greater budget allocation based on Gross Domestic Product - GDP of each nation, focused on research, development and innovation; in conjunction with advisory, training and education processes for entrepreneurs, SMEs and MSMEs in order to generate new products and services with intensive components in information for the digital transformation longitudinality in organizations, (Caicedo, C. H., & Smida, A. (2016); Briñez de León, J. C., Fandiño Toro, H. A., Restrepo Martínez, A., & Branch Bedoya, J. W. (2017); Herrera-Cubides, J. F., Gaona-García, P. A., Montenegro-Marín, C. E., Sánchez-Alonso, S., & Martin-Moncunill, D. (2019); Lemus P. , Garzón S. , y Tarazona B. (2016)).

Referencias bibliográficas

Advisory Services LLC, T. (2017). *Hacia la transformación digital de América Latina y el Caribe: El Observatorio CAF del Ecosistema Digital* (p. 2016). CAF. https://scioteca.caf.com/handle/123456789/1059

Agarwal, R. (2020). Transformación digital: Un camino al valor económico y social. *Revista CEA*, *6*(12), 9–12. https://doi.org/10.22430/24223182.1700

Autoridad de la Micro Pequeña y Mediana Empresa, ampyme. (2017). *Autoridad de la Micro, Pequeña y mediana Empresa ampyme—2017—DESARROLLO DE LOS CENTROS DE ATENCIÓN A LAS MIPYME. GUÍA RÁPIDA PARA EMPRENDEDORES - GUÍA PRÁCTICA PARA CREAR SU EMPRESA*. https://ampyme.gob.pa/wp-content/uploads/2020/04/GUIA-RAPIDA-PARA-EMPRENDEDORES.pdf

Baiyere, A., Salmela, H., & Tapanainen, T. (2020). Digital transformation and the new logics of business process management. *European Journal of Information Systems*, *29*(3), 238–259. https://doi.org/10.1080/0960085X.2020.1718007

BIRF - AIF, B. M. (2016). Africa: Panorama General. En *Annual Reports 2015*. https://www.bancomundial.org/es/about/annual-report-2015-copy/annual-report1/regions/afr

Blumel Mac-Iver, G., & Ministerio Secretaria General de la Presidencia, C. (2018). *La estrategia de Transformación Digital del Estado*. https://digital.gob.cl/doc/estrategia_de_transformacion_digital_2019_.pdf

CAF. (2020). *Las oportunidades de la digitalización en América Latina frente al Covid-19*. CAF. https://scioteca.caf.com/handle/123456789/1541

CAF, B. de D. de A. L. (2013). *Sector TIC: Colombia* (pp. 1–23). https://scioteca.caf.com/bitstream/handle/123456789/578/cartilla_colombia.pdf?sequence=1&isAllowed=y

CAF, B. de D. de A. L., Chomali, E., Suniaga, J., Núñez, G., Jordán, V., Rojas, F., Negrete, J., Bravo, J., Bertolini, P., Katz, R., Callorda, F., & Jung, J. (2020). *Las oportunidades de la digitalización en América Latina frente al Covid-19*. CAF. https://scioteca.caf.com/handle/123456789/1541

Briñez de León, J. C., Fandiño Toro, H. A., Restrepo Martínez, A., & Branch Bedoya, J. W. (2017). Análisis de resolución en imágenes de fotoelasticidad: caso carga dinámica. Visión electrónica, 11(1), 69-75. https://doi.org/10.14483/22484728.12789

Caicedo, C. H., & Smida, A. (2016). Intensidad informacional para la longitudinalidad asistencial en sistemas de salud. Visión electrónica, 10(1), 83-95. https://doi.org/10.14483/22484728.11612

CISCO. (2016). *VNI Complete Forecast Highlights* (pp. 1–5). https://www.cisco.com/c/dam/m/en_us/solutions/service-provider/vni-forecast-highlights/pdf/Global_2020_Forecast_Highlights.pdf

CONAMIPYME, C. N. de la M., Pequeña y Mediana Empresa. (2017). *Manual Operativo y Reglamento CDE MIPYME - Hoduras*. http://cdemipymeroc.org/documentos/Manual_Operativo_y_Reglamento_CDE_MIPYME.pdf

CONAMIPYME, C. N. de la M., Pequeña y Mediana Empresa. (2019). *Plan Estratégico CDE 2019 2024*. http://cdemipymeroc.org/documentos/Plan_estrategico_CDE%20_2019_2024.PDF

Cortés, N. L. B., & Cortez, R. E. J. (2018). *Propuesta de Fortalecimiento para los Centros de Desarrollo Empresarial (CDE) de la Región Central del Valle del Cauca* [Bachelor Thesis, UNIVERSIDAD DEL VALLE FACULTAD DE CIENCIAS DE LA ADMINISTRACIÓN PROGRAMA DE ADMINISTRACIÓN DE EMPRESAS TULUÁ]. pd. https://bibliotecadigital.univalle.edu.co/bitstream/handle/10893/14648/0586675.pdf;jsessionid=97EE2006980812BF9EA615012C89D923?sequence=1

Curbelo, J. L. (2017). Competir en la transformación digital. *Economía Industrial*, *404*, 135–145. https://www.mincotur.gob.es/Publicaciones/Publicacionesperiodicas/EconomiaIndustrial/RevistaEconomiaIndustrial/404/JOS%C3%89%20LUIS%20CURBELO.pdf

CONPES Política Nacional de Emprendimiento 4011, 94 (2020). https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/4011.pdf

CONPES Política Nacional para la Transformación Digital e Inteligencia Artificial 3975, 63 (2019). https://colaboracion.dnp.gov.co/CDT/Conpes/Económicos/3975.pdf

DANE, D. A. N. de E. (2020). *Resultados Censo Nacional de Población y Vivienda 2018*. DANE. https://www.dane.gov.co/index.php/estadisticas-por-tema/demografia-y-poblacion/censo-nacional-de-poblacion-y-vivenda-2018

Emprender, F. (2019). *CENTRO DE DESARROLLO EMPRESARIAL - SBDC Dirección de Empleo, Trabajo y Emprendimiento 2019*. https://www.camaraguajira.org/publicaciones/memorias/2019/plan-impacto-guajira/sena.pdf

EU, E. U. (2020). *Support for business innovation*. Enterprise Europe Network. https://een.ec.europa.eu/content/support-business-innovation

Euphorianet. (2020). *More than 300 projects guarantee our commitment and experience in software development, web design, marketing and systems integration.* https://www.euphoria-net.com/about-us

Fiducoldex, F. C. de C. E. S. A., & Innpulsa Colombia, U. de G. de C. E. (2020). *CONVOCATORIA NACIONAL PARA LA TRANSFORMACIÓN DE UNIDADES DE DESARROLLO EMPRESARIAL EN CENTROS DE TRANSFORMACIÓN DIGITAL EMPRESARIAL, O APOYAR LA CONTINUIDAD DE LOS CENTROS QUE FUERON TRANSFORMADOS POR INNPULSA BAJO LA CONVOCATORIA CTDE-017*. https://innpulsacolombia.com/sites/default/files/convocatorias-pdf/TDR%20CTDE%202020.pdf

Garzón, B. V., Bustos, J. P. G., & Morato, M. A. M. (2019). Production engineering immersed in the creative economy. *Visión Electrónica*, *13*(1), 195–210. https://doi.org/10.14483/22484728.14411

Guenzi, P., & Habel, J. (2020). Mastering the Digital Transformation of Sales. *California Management Review*, *62*(4), 57–85. https://doi.org/10.1177/0008125620931857

Hernández Hernández, S., & Camelo Posada, S. E. (2019). *Transformación digital de las organizaciones* [Bachelor Thesis, Universidad Distrital Francisco José de Caldas - Facultad de Ingenieria]. http://repository.udistrital.edu.co/handle/11349/14842

Hernández Sampieri, R., Fernández Collado, C., Baptista Lucio, P., Valencia, S. M., & Mendoza Torres, C. P. (2014). *Metodología de la investigación—Sexta edición* (6a ed.). McGraw-Hill Education. http://observatorio.epacartagena.gov.co/wp-content/uploads/2017/08/metodologia-de-la-investigacion-sexta-edicion.compressed.pdf

Herrera-Cubides, J. F., Gaona-García, P. A., Montenegro-Marín, C. E., Sánchez-Alonso, S., & Martin-Moncunill, D. (2019). Abstraction of linked data's world. Visión electrónica, 13(1), 57-74. https://doi.org/10.14483/22484728.14397

Lemus P. , Garzón S. , y Tarazona B. (2016). TIC en gestión de la cadena de suministro bogotana. Visión electrónica, 10(2), 195-202. https://doi.org/10.14483/22484728.11653

Ley 67 de 1979. "Por la cual se dictan las normas generales a las que deberá sujetarse el Presidente de la República, para fomentar las exportaciones a través de las Sociedades de Comercialización internacional, y se dictan otras disposiciones para el fomento del comercio exterior" (December 26th 1979), Pub. L. No. 67 de 1979 (1979). https://www.mincit.gov.co/mincomercioexterior/temas-de-interes/sistemas-especiales/2-comercializadoras-internacionales/leyes/ley-67-de-1979.aspx

Ley 905 de 2004 "Por medio de la cual se modifica la Ley 590 de 2000 sobre promoción del desarrollo de la micro, pequeña y mediana empresa colombiana y se dictan otras disposiciones" (August 2nd 2004), Pub. L. No. 590 de 2000, Diario Oficial No. 44.078 de 12 de julio 2000 (2004). http://www.secretariasenado.gov.co/senado/basedoc/ley_0590_2000.html

Ley 590 de 2000. "Por la cual se dictan disposiciones para promover el desarrollo de las micro, pequeñas y medianas empresas", Pub. L. No. 590 de 2000, Diario Oficial No. 44.078 de 12 de julio 2000 (2000). http://www.secretariasenado.gov.co/senado/basedoc/ley_0590_2000.html

Ley 1838 de 2017 "Por la cual se dictan normas de fomento a la ciencia, tecnología e Innovación mediante la creación de empresas de base tecnología (SPIN-OFFS) y se dictan otras

disposiciones" (July 6th 2017), Pub. L. No. 1838 de 2017, Diario Oficial No. 50.286 de 6 de julio de 2017 (2017). http://www.secretariasenado.gov.co/senado/basedoc/ley_1838_2017.html

LEY 1014 DE 2006 "De fomento a la cultura del emprendimiento", Pub. L. No. 1014 de 2006, Diario Oficial 46.164 de 27 de enero de 2006 (2006). http://www.secretariasenado.gov.co/senado/basedoc/c-392_2007.html

IMF, I. M. F. (2020). *Actualización de las perspectivas de la economía mundial* (p. 23) [Economic report]. IMF-International Monetary Fund. https://www.imf.org/es/Publications/WEO/Issues/2020/06/24/WEOUpdateJune2020

Innpulsa Colombia, U. de G. de C. E., MinCIT, M. de C. I. y T., & UN, U. N. de C. (s/f). *Mapeo Ecosistemas Regionales del Emprendimiento en Colombia.* (p. 294). pdf. Recuperado el 26 de agosto de 2020, de https://innpulsacolombia.com/sites/default/files/documentos-recursos-pdf/2.2_mapeo_e_infografia.pdf

Juca Maldonado, F. X., & Jaramillo Matute, D. G. (2019). La transformación digital adaptada al contexto universitario para su inclusión en los nuevos modelos de negocio y reducción del impacto medioambiental. *Revista Metropolitana de Ciencias Aplicadas*, *2*(2), 200–203. https://remca.umet.edu.ec/index.php/REMCA/article/view/153/229

Kretschmer, T., & Khashabi, P. (2020). Digital Transformation and Organization Design: An Integrated Approach. *California Management Review*, *62*(4), 86–104. https://doi.org/10.1177/0008125620940296

Meller, P., & Parodi, P. (2017). *La importancia de la capabilidad tecnológica en un mundo global* [Case of Study]. CAF; CIEPLAN. https://scioteca.caf.com/handle/123456789/1073

MinCIT, M. de C. I. y T. (2014). *Centros de Desarrollo Empresarial para las MiPymes—Manual Operativo*. https://innpulsacolombia.com/sites/default/files/convocatorias-pdf/anexo_iii_manual_operativo_1.pdf

MinCIT, M. de C. I. y T. (2018). *Centro de Desarrollo Empresarial—Mi Pymes*. CENTROS DE DESARROLLO EMPRESARIAL. http://www.mipymes.gov.co/programas/centro-de-desarrollo-empresarial

MinCIT, M. de C. I. y T. (2020a). *Conozca más—MINCIT - Ministerio de Comercio, Industria y Turismo*. Mincomercio. https://www.mincit.gov.co/ministerio/conozco-mas

MinCIT, M. de C. I. y T. (2020b). *Las mipymes del país tendrán herramientas gratuitas para implementar comercio electrónico, gracias a Compra Lo Nuestro y StoreON*. Noticia de Noticias. http://colombiasigueadelante.mincit.gov.co/prensanot/noticias/las-mipymes-del-pais-tendran-herramientas-gratuita

MinCIT, M. de C. I. y T., & Innpulsa Colombia, U. de G. de C. E. (2020, mayo). *Abierta tercera convocatoria para desarrollar nuevos Centros de Transformación Digital Empresarial—Innpulsa*. https://innpulsacolombia.com/innformate/abierta-tercera-convocatoria-para-desarrollar-nuevos-centros-de-transformacion-digital

MinTIC, M. de T. de la I. y las C. (2016, septiembre 14). *Las TIC transformarán la producción agraria y contribuirán a la construcción de la nueva Economía Digital: Ministro Luna—MinTIC*. Sala de Prensa MinTIC. https://www.mintic.gov.co/portal/inicio/Sala-de-Prensa/Noticias/17493:Las-TIC-transformaran-la-produccion-agraria-y-contribuiran-a-la-construccion-de-la-nueva-Economia-Digital-Ministro-Luna

MinTIC, M. de T. de la I. y las C. (2019). *MinTIC ya está implementando las recomendaciones de la OCDE para la trasformación digital—Ministerio de Tecnologías de la Información y las Comunicaciones*. MinTIC ya está implementando las recomendaciones de la OCDE para la

trasformación digital. https://www.mintic.gov.co/portal/inicio/Sala-de-Prensa/Noticias/106833:MinTIC-ya-esta-implementando-las-recomendaciones-de-la-OCDE-para-la-trasformacion-digital

MinTIC, M. de T. de la I. y las C. (2020, agosto). *Acerca del MinTIC*. Acerca del MinTIC. http://www.mintic.gov.co/portal/604/w3-propertyvalue-540.html

MinTIC, M. de T. de la I. y las C., Abuchaibe, K. A., & Gaviria Mantilla, I. A. (2020). *Plan de Transición a Nuevas Tecnologías* (p. 55). https://www.mintic.gov.co/portal/604/articles-145550_plan_transicion_nuevas_tecnologias_20200624a.pdf

MinTIC, M. de T. de la I. y las C., Rengifo, S. C., & Gaviria Mantilla, I. A. (2020). *Plan TIC 2018 – 2022 El Futuro Digital es de Todos* (p. 107). Ministerio de Tecnologías de la Información y las Comunicaciones MinTIC. https://micrositios.mintic.gov.co/plan_tic_2018_2022/pdf/plan_tic_2018_2022_20200107.pdf

OECD, O. for E. C. and D. (2017). *OECD Digital Economy Outlook 2017*. OCDE. http://data.oecd.org/ict/ict-investment.htm

OECD, O. for E. C. and D. (2019a). About the OECD - OECD. En *Who we are OECD*. https://www.oecd.org/about/

OECD, O. for E. C. and D. (2019b). *Cómo medir la transformación digital: Hoja de ruta para el futuro | es | OCDE | OECD*. 1–268. https://doi.org/10.1787/af309cb9-es

OECD, O. for E. C. and D. (2019c). *Perfilando la transformación digital en América Latina: Mayor productividad para una vida mejor*. https://www.oecd-ilibrary.org/docserver/4817d61b-es.pdf?expires=1598370284&id=id&accname=guest&checksum=9A2EB48B605E7EE81471D76442A4E9E6

OECD, O. for E. C. and D. & CAF Development Bank of Latin America. (2019). *América Latina y el Caribe 2019: Políticas para PYMEs competitivas en la Alianza del Pacífico y países participantes de América del Sur*. OECD Publishing, Paris. https://doi.org/10.1787/60745031-es

OECD, O. for E. C. and D., Development Bank of Latin America, C., & European Union. (2019). *Perspectivas económicas de América Latina 2019: Desarrollo en transición*. Organización para la Cooperación y el Desarrollo Económicos OCDE. https://doi.org/10.1787/g2g9ff1a-es

Pinto, A. C. L., Sogamoso, C. A. G., & Bermúdez, G. M. T. (2016). Tic en gestión de la cadena de suministro bogotana. *Visión electrónica*, *10*(2), 195–202. https://doi.org/10.14483/22484728.11653

RICOH. (2020). ¿Cómo comenzar la transformación digital en tu empresa? En *¿Cómo comenzar la transformación digital en tu empresa?* https://www.ricoh-americalatina.com/es/sala-de-prensa/transformacion-digital-en-tu-empresa

States, O.-O. of A., R. Ramdin, A., & Organización de los Estados Americanos OEA. (2012). *From Port of Spain (2009) to Cartagena de Indias (2012): Volume VI (2012)* (Vol. 6). http://www.summit-americas.org/pubs/pos_ctg.pdf

The Economic Commission for Latin America, E. (2014). About ECLAC. En *About ECLAC*. https://www.cepal.org/en/about-eclac-0

WEF, W. E. F. (2020). *Accelerating Digital Inclusion in the New Normal*. WEF-World Economic Forum. https://www.weforum.org/reports/accelerating-digital-inclusion-in-the-new-normal

West, J. (2018). Asia's Stunted Economic Development. En J. West (Ed.), *Asian Century… on a Knife-edge: A 360 Degree Analysis of Asia's Recent Economic Development* (pp. 19–55). Springer. https://doi.org/10.1007/978-981-10-7182-9_2