

Chapter 01

Rethinking homo economicus

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Digital technologies and their impact on the local economy

Las tecnologías digitales y su impacto en la economía local

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ABSTRACT

The impact of digital technologies on the economic development of localities is currently a growing field of study. This field is characterized by the acceleration of digital transformation processes in various territorial contexts. The objectives of this study are to identify the predominant thematic trends in recently published literature to examine the enabling factors and critical barriers to the effective adoption of these technologies and to assess the implications for equity and sustainability. The methodology employed adopts a mixed-methods approach by applying bibliometric techniques combined with the systematic analysis of scientific output indexed in high-impact databases. The analysis conducted in this study was structured in the successive phases of identification, filtering, categorization, and critical synthesis of publications, with a descriptive and interpretive scope. The main results revealed the existence of complex patterns that have gone beyond analyses focused on connectivity and now highlight the centrality of collaborative governance, the development of endogenous capabilities, and the adaptation of small and medium-sized enterprises' business models. It is concluded that the local economic impact of digital technologies is mediated by an institutional and sociocultural framework that shapes their trajectory.

Keywords: Digital Capabilities; Local Development; Regional Economy; Governance; SMES; Digital Transformation.

INTRODUCTION

With the advent of the Fourth Industrial Revolution, a socioeconomic paradigm has emerged in which digital technologies are recognized as a fundamental substrate of human activity. This phenomenon manifests itself in heterogeneous ways across different geographical scales. Sanabria⁽¹⁾ acknowledges that, in this sense, the local level is the primary setting where its effects are tangibly measured; therefore, local economies—understood as complex ecosystems of productive, commercial, and social interactions—find themselves in a position of adapting to this new logic in a way that allows them to move as far as possible away from accelerated marginalization.

The approach to this issue is shaped by the need to deconstruct deterministic narratives that directly link the use of digital technology to economic progress.⁽²⁾ Recent literature provides evidence that access to digital infrastructure does not in itself guarantee benefits. In contrast, the integration of digital technologies into any process can exacerbate preexisting inequalities if it is carried out from a perspective focused on the quantity and quality of their introduction rather than on the set of systemic conditions that accompany them.⁽³⁾ In this context, the scientific and academic community is responsible for determining the conditions under which digital technology becomes a lever for development, with a focus on inclusion and sustainability,

beyond its use as a tool for efficiency.

From a social perspective, the analysis of this issue is an unquestionable priority.⁽⁴⁾ Undoubtedly, the revitalization of localities, job creation, and social cohesion in a globalized world are mediated by digital technologies; their acceptance and significance depend, to a large extent, on the capacity of communities to critically appropriate these tools.⁽⁵⁾ Consequently, this study focuses on exploring the intersection of economics, technological sociology, and public policy from an interdisciplinary perspective, with the aim of capturing the complexity of this phenomenon.

A review of the literature from the past five years reveals a significant theoretical gap regarding this topic.⁽⁶⁾ On the one hand, there is a large body of studies quantifying the correlation between digitalization indicators and economic metrics; on the other hand, there are evident limitations in understanding the causal mechanisms and underlying social processes.

Another limitation of the published literature is that it tends to focus on the analysis of large urban agglomerations, given the background of the specific dynamics of small cities, particularly those in rural areas and peripheral regions.⁽⁷⁾ This article seeks to synthesize and contrast the evidence in a way that allows for the construction of a holistic interpretive framework through the application of bibliometric techniques and critical analysis. It proposes to move beyond the superficial description of the findings in the selected literature by analyzing the logic of local innovation ecosystems and the interactions that occur among specific actors, institutions, and technologies.⁽⁸⁾

In this context, this article contributes to the academic discussion through the authors' integrated perspective, which is based on striking a balance between the technical and human dimensions of digital development.⁽⁹⁾ It argues for the importance of building high-quality collaborative networks with a shared strategic vision, underpinned by investment in advanced human capital as the foundation of digital transformation strategies in local communities.⁽¹⁰⁾ Similarly, it is grounded in the premise that digital technologies should be viewed as social tools whose value is collectively constructed.

Therefore, their economic impact must be linked to power structures, organizational cultures, and learning capacities within these territories. From this human-centered perspective, the aim is to reaffirm the central role of citizens and communities in shaping the digital future.⁽¹¹⁾ Consequently, the objectives of this research are, first, to identify the state of the art regarding the impact of digital technologies on local economies so that it is possible to recognize the theoretical and methodological trends currently prevailing and, second, to critically analyze the contextual factors that shape these impacts, characterizing both successful experiences and recurring failures.⁽¹²⁾

METHOD

This study employs a mixed-methods research approach, utilizing bibliometric analysis techniques, which are justified by their suitability for synthesizing a large volume of literature in a systematic and objective manner. This allows for the quantification and qualification of intellectual output in a specific field of knowledge while identifying patterns, trends, and knowledge networks. The selection of this design corresponds to one of the purposes of this work: to build a solid empirical foundation upon which to base the theoretical discussion, drawing on evidence accumulated by the international scientific community.

The research was conducted in four consecutive and rigorously designed methodological phases, which allowed for the development of the research process in an exhaustive and transparent manner, as shown in figure 1.

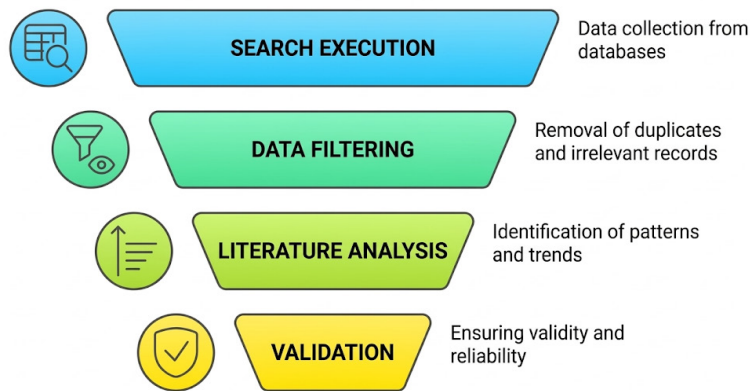


Figure 1. Bibliometric research process

In the first phase, the search strategy was defined, and the documentary universe for information and knowledge management was delimited. The inclusion and exclusion criteria were established based on the thematic relevance, publication period, document type, and impact indicators of the sources consulted.

The second phase focused on conducting the search, locating, and retrieving the information. To this end, the Scopus and Web of Science databases were consulted and recognized as the most comprehensive in the social and economic sciences. The search terms were structured around key concepts such as digital technologies, the local economy, regional development, smart cities, digital entrepreneurship, and the digital divide and were combined using Boolean operators.

The impact of digital technologies on the economic development of localities constitutes an expanding field of study. This field is marked by the acceleration of digital transformation and processes in various territorial contexts. This article presents an analysis of this impact using a multifaceted approach to reveal the mechanisms through which digitization processes reconfigure productive systems, labor markets, and territorial governance. The objectives of this study are to identify the predominant thematic trends in recently published literature to examine the enabling factors and critical barriers to the effective adoption of these technologies and to assess the implications for equity and sustainability.

The methodology employed adopts a mixed-methods approach by applying bibliometric techniques combined with the systematic analysis of scientific output indexed in high-impact databases. The analysis conducted in this study was structured in the successive phases of identification, filtering, categorization, and critical synthesis of publications, with a descriptive and interpretive scope. The main results revealed the existence of complex patterns that have gone beyond analyses focused on connectivity and now highlight the centrality of collaborative governance, the development of endogenous capacities, and the adaptation of business models for small and medium-sized enterprises.

It is concluded that the local economic impact of digital technologies is mediated by an institutional and sociocultural framework that shapes their trajectory. The results enabled the identification of new lines of research aimed at deepening the measurement of long-term impacts and the design of context-specific public policies aimed at mitigating the risks of polarization.

RESULTS

With the advent of the Fourth Industrial Revolution, a socioeconomic paradigm has emerged in which digital technologies serve as a fundamental substrate of human activity. This phenomenon is characterized by heterogeneous manifestations across different geographic scales, with the local level being the primary setting where its effects materialize and are tangibly measured.⁽¹³⁾ Consequently, local economies—understood as complex ecosystems of productive, commercial, and social interactions—find themselves in a position of adapting to this new logic to move as far as possible away from accelerated marginalization.

One of the first aspects observed in the bibliometric analysis conducted lies in the notable growth and acceleration of the volume of literature on this topic, which is also characterized by a wide diversification of approaches and criteria.⁽¹⁴⁾ Initially, these studies focused on analyzing the effects of telecommunications infrastructure; however, more recently, the publications reviewed address intangible dimensions such as digital social capital and data governance. It follows, therefore, that the evolution of discussions on the topic in academic and scientific circles has shifted from an instrumental view of technology toward a more situated and contextual understanding.⁽¹⁵⁾

In the discussion of this topic, small and medium-sized enterprises are viewed as key players in local digital transformation. The literature reviewed agrees that the adaptation of these enterprises is a major factor in the economic resilience of each region.⁽¹⁶⁾ Furthermore, there is significant heterogeneity in the design of digitalization strategies, ranging from the simplest—with a basic presence in online digital environments—to the complete reengineering of business models.

Governance emerges as a fundamental analytical category in these analyses. Multilevel governance models that achieve coordination among public, private, and civil society actors are associated with more inclusive and sustainable digitization processes. In contrast, vertical or exclusively technocratic approaches generate resistance to technology and, at times, deepen preexisting social divides in local communities.

Another significant finding from the literature review pertains to experiences demonstrating that the development of endogenous digital capabilities is such a decisive factor that it has already become a critical element in these processes. Consequently, technology transfer must be accompanied by parallel investment in education, vocational training, and advanced digital literacy.⁽¹⁷⁾

DISCUSSION

In this context, several success stories are presented on the basis of the design of local educational ecosystems that serve as sources of human talent for businesses and, in turn, for local governments.⁽¹⁸⁾ These case studies demonstrate that ensuring broadband connectivity is necessary but no longer sufficient to achieve the expected economic impacts.⁽¹⁹⁾

Currently, these impacts are mediated by service reliability, connection quality, and citizens' digital skills for the efficient use and full exploitation of technological potential.⁽²⁰⁾ It is evident that, in various regions, there is a documented contradiction between the verifiable fact of

possessing adequate infrastructure and the absence of widespread productive adoption.

The use of digital sharing economy platforms is subject to ambivalent interpretations.⁽²¹⁾ On the one hand, these platforms democratize market access for local suppliers; on the other hand, they introduce new forms of job insecurity and pose challenges to traditional regulatory frameworks.⁽²²⁾ Their actual contribution to the local economy depends on the ability of companies and institutions to manage these ambiguities.

For their part, smart cities are continually evolving, shifting from a concept centered on urban efficiency through sensors and data toward more citizen-oriented approaches. The most recent literature highlights the emphasis placed on the need to put technology at the service of improving people’s quality of life and living conditions, thereby fostering citizen participation.⁽²³⁾

To avoid polarizing technological solutions, digital entrepreneurship can be considered a driver of innovation and economic diversification.^(24,25) Thus, regions that succeed in designing and implementing entrepreneurial ecosystems with access to seed capital, mentors, and networks achieve a greater capacity to generate high-paying jobs and, consequently, attract more talent as an external resource for businesses (figure 2).

Impacto de las tecnologías digitales en la economía local

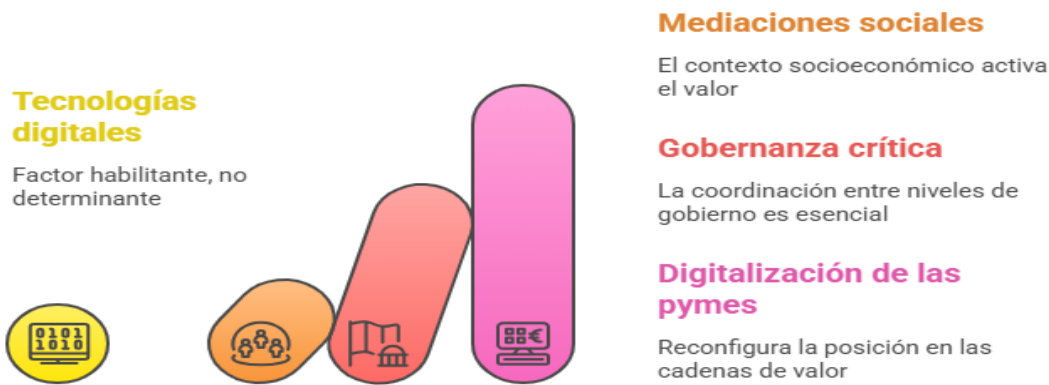


Figure 2. Effects of digital technologies on the local economy

In all these scenarios, the digital divide manifests itself in multiple dimensions. These include access to technology, the quality of connectivity, the use of technology, and its impact.⁽²⁶⁾ Research has shown that this divide not only exacerbates the gap between rich and poor regions but is also reflected within localities, where groups differ in age, gender, educational level, and economic sector.⁽²⁷⁾

In this context, universal policies remain ineffective at addressing the multidimensional nature of technological integration.⁽²⁸⁾ Recent literature identifies the achievement of environmental sustainability as a cross-cutting theme in the analyses conducted, with a consensus among authors regarding the potential of digital technologies to contribute—positively or negatively—to the ecological transition.⁽²⁹⁾ As examples of positive contributions, effective initiatives

through logistics optimization, smart resource management, or the promotion of telework are highlighted. However, the carbon footprint of the digital sector itself is highlighted as a cause for concern, identified as a negative contribution.

In this context, building digital trust is a prerequisite for the adoption of advanced technologies.⁽³⁰⁾ With respect to cybersecurity and data privacy, concerns persist that technologies may hinder the implementation of solutions in critical areas such as healthcare or e-government.⁽³¹⁾ Specifically, building such trust requires the design of regulatory frameworks whose application is based on transparency. In the specific case of small and medium-sized enterprises, the studies reviewed highlight the challenges these family-owned businesses face in adapting to digital technologies.⁽³²⁾ In this regard, the analysis conducted in this study argues that the digitalization of these firms should not be evaluated solely through indicators of survival and sustainability but also on the basis of their ability to reconfigure their position in global value chains.⁽³³⁾ These issues are part of the discussion on economic upgrading and value capture, aspects currently being revisited from a critical perspective in contrast to traditional microeconomic literature.

Since the beginning of the century, the International Telecommunication Union has warned about the multidimensional digital divide.⁽³⁴⁾ Current discussions focus on the interrelationship of these dimensions, with the debate centered on the design of strategies that ensure an effective balance. It has been demonstrated that bridging the access gap does not necessarily imply a reduction in the usage gap.⁽³⁵⁾ This requires public interventions that intentionally adopt multifaceted approaches, as seen in the results of some successful cases documented in the literature, particularly in the European Union, with digital mentoring programs for adults.

Another topic of intense debate revolves around the ambivalent use of digital platforms.⁽³⁶⁾ The authors agree with critical perspectives on platform capitalism but identify, in a nuanced manner, cases in which these tools have served to empower artisanal producers and tourism operators in rural areas.⁽³⁷⁾ As the reviewed literature suggests, the evidence shows that the key lies in designing platform governance models that prioritize value for the local community over financial gains. On the other hand, the evolution in the conceptualization of smart cities reveals a shift away from the initial technocratic paradigm, which aligns with observations made in urban planning studies, where there is a transition toward the notion of a smart and human city.⁽³⁸⁾ These studies demonstrate the intention for prospective projects to aim for greater integration of digital humanities into urban policy design, thereby ensuring that technology serves clearly defined social and democratic purposes.⁽³⁹⁾

The predominance of literature published in English and in indexed journals constitutes one of the limitations identified in this study.⁽⁴⁰⁾ Consequently, in the discussion of this topic, valuable experiences that are documented in other languages or formats may exist. It is therefore suggested that future research complement the contributions of this work through in-depth ethnographic case studies that document experiences through the voices and perceptions of local actors directly involved in the territories and localities where technological interventions take place.⁽⁴¹⁾ Another identified limitation lies in the constant dynamism of the subject of the study. Scientific and technological development is advancing so rapidly that any framework based on a review of the literature risks becoming outdated in a relatively short period of time.⁽⁴²⁾ To mitigate these weaknesses, future studies should incorporate continuous technology viewing techniques to monitor the emergence of new disruptive technologies and their implications.

In the future, this work opens the door to new lines of research addressing the need to develop more sophisticated metrics for the qualitative assessment of digitization processes.

⁽⁴³⁾ The analysis reveals that traditional indicators, such as the number of connections or the volume of e-commerce, are insufficient for evaluating profound transformations in areas such as job quality, environmental sustainability, or social cohesion.⁽⁴⁴⁾ Therefore, incorporating indicators that allow for multidimensional evaluation into the theoretical framework constitutes an open line of research for the coming decade.⁽⁴⁵⁾ From a regional perspective, the discussion underscores the urgency of developing research and innovation agendas specific to Latin America. The practice of transposing or imitating successful models from other regions has, in most cases, proven counterproductive, as it fails to account for the institutional, cultural, and structural particularities of the contexts specific to this region.⁽⁴⁶⁾ The establishment of a South-South dialog that addresses these issues collaboratively could represent an efficient and effective pathway for the social construction of relevant knowledge in Latin American contexts.⁽⁴⁷⁾

Among the main findings of the reviewed literature are warnings about the ineffectiveness of interventions that prioritize investments in infrastructure and technology over the training of human talent.⁽⁴⁸⁾ Consequently, it is suggested that institutional policies allocate considerable resources to critical digital education, continuous professional development, and the promotion of an entrepreneurial culture adapted to new digital contexts.⁽⁴⁹⁾ All these issues constitute central pillars that significantly reorient the academic and scientific debate on this topic. These findings can likely be applied in other contexts where digital transformation processes are underway.⁽⁵⁰⁾ Such processes depend on the design of their innovation ecosystem, the digitization of their cultural and educational institutions, and their ability to generate a shared vision for staff training and redefine the value proposition in digital environments. Therefore, the guiding principle of these processes is to put technology at the service of a clearly defined social mission.⁽⁵¹⁾

The research suggests future lines of inquiry that address the need for longitudinal studies measuring the digital impact on specific local economies over time, taking into account intraregional inequalities and paying particular attention to gender, age, and ethnicity—factors that shape the associated opportunities, benefits, and risks.

CONCLUSIONS

This study demonstrates that the relationship between digital technologies and the local economy is marked by inherent complexity, stemming from a web of factors that transcend purely technical factors. The results of the bibliometric analysis confirm that economic impact depends on the quality of institutions, the density of social capital, and the existence of endogenous capacities to absorb, adapt, and reinvent available technologies. It is concluded that, from a holistic perspective that integrates economic, social, political, and cultural dimensions, it is possible to move toward inclusive local development in the digital age.

This work contributes to the consolidation of an interpretive framework that emphasizes the agency of local actors over technological determinism. By identifying and synthesizing the literature published in high-impact databases, it offers a well-founded analysis that serves as a reference for future research aimed at the operationalization and reconceptualization of these terminologies and processes, as well as the measurement of their interrelationships using mixed methods. The educational and social value of this study lies in its referential nature, as it guides the design of public policies and training programs that recognize collaborative governance and capacity building as central pillars for humanizing the integration of digital technologies.

In conclusion, the analysis allows us to envision a future in which local economic development is determined by the collective wisdom to govern technology rather than by the quantity or

quality of the technology adopted. Consequently, the creation of prosperous, resilient, and equitable local economies depends on the human capacity to cultivate not only technical talent but also social intelligence and civic engagement—essential elements for guiding technological change toward the common good.

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