

IMPACT OF TECHNOLOGICAL INNOVATION ON DIGITAL ENTREPRENEURSHIP AND THE EFFECTS ON THE ECONOMY.

Abstract

Digital entrepreneurship is a recent phenomenon that has emerged owing to various factors, including technological innovation. This kind of entrepreneurship is currently implemented in many countries and has the potential to boost the economy and reduce poverty by creating employment and self-employment. This paper primarily looks to analyse the influence of technological innovation on the growth of digital entrepreneurship, and its effects on the economy through growth in employment. In the absence of any systematic review on this subject, this study aims to map the relevant research and study the relationship between technological innovation and digital entrepreneurship. A Systematic Literature Review methodology based on a sample of 76 papers from the Scopus and Web of Science databases, published between 1990 and 2022, has been used to identify, select, and evaluate published research. The results confirm that technological innovation is an important driver of digital entrepreneurship, but it needs to be combined with other key factors, such as digital knowledge and skills. This study contributes to existing literature by providing a more realistic view of what digital entrepreneurship means for individuals' prosperity and generates valuable knowledge to create necessary conditions to promote sustainable and successful digital entrepreneurship. It also identifies several future lines of research that should offer meaningful value to academics and practitioners.

Keywords: Digital Entrepreneurship; Technological Innovation; Economic Growth; Systematic Literature Review

Introduction

The study of entrepreneurship as a field of research seeks to understand how opportunities to bring into existence 'future' goods and services are discovered, created, and exploited, by whom, and with what consequences (Venkataraman, 1997). Based on this original definition of entrepreneurship, digital entrepreneurship could be defined as the process of creating and pursuing entrepreneurship opportunities using Information and Communication Technologies (ICT). (Antonizzi & Smuts 2020).

Digital entrepreneurship is a novel concept. It was coined in the 90s with the emergence of new technologies and was developed during the late twentieth century. The goal is to create business, but in the new context of the digital era. Digital environments provide more information than the "physical" world does. Therefore, digital entrepreneurs have access to much wider and more varied markets than traditional entrepreneurs do, owing to the scope and scale of the Internet (Ladeira et al., 2019). New technological platforms such as Google, Instagram, YouTube etc. have caused an explosion of digital entrepreneurs who are generating self-employment and boosting the economy. Technological innovation has promoted the figure of the digital entrepreneur, paving the way for those deciding to be an entrepreneur by offering options that entail lower costs in terms of investment, effort and potential results.

Driven by technological innovation, this phenomenon has been studied and analysed in recent decades from various perspectives. Research claims that new business models are only possible through the enabling function of ICT (Rai and Tang, 2014; Steininger, 2019). Researchers view technology as an enabler, which enables young entrepreneurs by bridging the gap between invention and the creation of a new business venture (Steininger 2019). In addition, digital entrepreneurship helps to lower entry barriers, eliminate company risks, reduce the cost of launching a new business, and is more sustainable (Akhter et al., 2022). Digital entrepreneurship is now being implemented in many countries, and recent studies suggest that it could have the potential to

boost the economy and social development by creating employment and self-employment, attracting investment, and generating competitive advantages (Richter et al., 2017).

Although there are studies about the relationship between technological innovation and digital entrepreneurship, there is no Systematic Literature Review (SLR) that analyses that relationship and confirms it is directly proportional. In addition, previous studies do not analyse the type of entrepreneurship generated, its characteristics, and whether it truly generates quality employment. Similarly, there is also a lack of empirical research as to whether digital entrepreneurship really could have the potential to boost the economy and alleviate poverty (Soluk et al., 2017).

This study looks to fill these gaps in the literature by performing an SLR about the relationship between technological innovation and digital entrepreneurship and the quality of the employment generated.

It is clear that the systematic review performed contributes to the literature in different ways. Firstly, it clarifies the relationship between technological innovation and digital entrepreneurship, which may favour the advancement of research. Specifically, three core thematic groups have been identified, which show different roles for technological innovation in the process of digital entrepreneurship. Secondly, it highlights the importance of digital entrepreneurship together with technological innovation to promote economic development. Lastly, the results reveal a large number of lines of research that have yet to be developed.

The structure of the paper is as follows: firstly, the literature about technological innovation and digital entrepreneurship is analysed, observing whether it has truly led to growth in entrepreneurship. This section further compares the relative importance of technological innovation to other key factors for the development of digital entrepreneurship, such as digital knowledge, digital culture, infrastructures, financial support, etc. The characteristics of digital entrepreneurship are then analysed to see whether it is sustainable. Secondly, the methodology adopted in this study is presented, and the results of the analysis are shown, responding to the questions initially raised. Lastly, the conclusions are set out together with the main contributions of this study.

Theoretical Background

The proliferation of digital technologies has sparked fresh debate about how new forms of entrepreneurial activity are facilitated (Chalmers et al. 2021). This increase in technological innovation has made entrepreneurs more aware of digital development (Zhao and Collier 2016).

The specialised literature shows that, by employing novel digital technology, digital entrepreneurship generates new initiatives and transforms ordinary businesses into modern ones (Hull et al., 2007), by switching to a digitised system (Elsafty et al., 2021). Authors such as Elia et al. (2020) argue that the fusion between entrepreneurship and digital technologies facilitates the main process required to launch a new venture. It is an enabling factor for entrepreneurial activity through different pathways: digital platforms, digital products, digital process, etc.

The impact of digital technologies on entrepreneurship is, therefore, multifaceted as they can be a facilitator, mediator, or outcome of entrepreneurial operations, or the overall business model (Steininger, 2019). Although the development of digital technologies in the past has strongly influenced the entrepreneurial process, some authors confirm that few empirical studies explore the relationship between digital technologies and entrepreneurship (Ghezzi and Cavallo 2018). In addition, the contribution made by existing studies is highly fragmented.

For some authors, the innovation system is considered a metasystem that provides the conditions for entrepreneurial activities and further innovation. This innovation system encompasses a number of different factors: political, legal, education, culture,

technological, etc. In this system, entrepreneurs must create new opportunities for investments and employment. They must be innovative: following the creative destruction process defined by Schumpeter (Satalkina and Steiner, 2020).

Our research focuses on innovation technology as the main driver of digital entrepreneurship. However, to understand the complex process of digital entrepreneurship, all the potential factors involved must be analysed. If digital enterprise creates jobs and contributes to the economic growth of many countries, exploring and identifying the determining factors of digital entrepreneurship is crucial to understanding the cause-and-effect relationships between them (Ladeira et al. 2019).

Specifically, authors such as Elia et al. (2020) analyse the different factors that influence the process of digital entrepreneurship, such as market accessibility, human capital availability, financial support, the presence of professional support services, the existence of an explicit regulatory framework, widespread digital culture, inter alia. Soluk et al. (2021) argue that family and community are one of the most important factors to achieve entrepreneurial goals in microenterprises. Another important driver highlighted by the research refers to digital skills and knowledge. Prendes-Spinosa et al. (2021) claim that digital competence, including the skills needed to do business online, is the key to success in digital entrepreneurship.

In recent years, several studies have discussed the circumstances and reasons that facilitate the digital transformation of businesses and public policies that support this phenomenon, given its impact on job creation and economic growth (Sahut et al., 2019; Cueto et al., 2022). Some authors argue that the emancipatory potential of digital entrepreneurship is significant, especially in developing countries, like India or Kenya, where innovation technology has contributed to poverty alleviation, community empowerment, and the promotion of inclusive development (Leong et al., 2022; Kumar et al., 2019).

In developing countries, digital entrepreneurship is broadly acknowledged as a driver of entrepreneurship. This is due to a number of factors, such as, for example, online platforms that enable the proliferation of online shops by lowering the entry barriers to starting a business (e.g., China's Alibaba and Taobao platforms). Similarly, in Africa, small-scale business has been promoted by this kind of platform (Leong et al., 2022).

From another perspective, some research concludes that the popular discourse on digital entrepreneurship as a generator of self-employment and wealth creation has been exaggerated and influenced by the dominant liberal economic theories of the 20th century. This has spread the idea that anyone can be an entrepreneur if they are bold enough. Nonetheless, there are studies that note the lack of empirical support for the popular claim that digital entrepreneurial activity can counter socio-economic marginality, and a function as a pathway to emancipation. They point to the lack of rigorous research investigating this phenomenon, which they feel is significantly underexplored, with a lack of consensus (Dy et al., 2018).

These issues are beginning to be studied by some authors who state that the subsistence economy is a growing reality in digital entrepreneurship, especially in developed countries. As claimed by Fernandes et al. (2022), digital entrepreneurs are usually presented as young, urban, innovative, well-educated individuals. However, authors like Delacroix et al. identify digital subsistence entrepreneurs as a new type of entrepreneur emerging recently in developed countries. The exchange and sharing of goods, information, and knowledge on digital platforms such as Facebook is the origin of this trend in digital entrepreneurship.

Due to all of the above, the following research questions have been defined to guide the SLR conducted here:

RQ1: Is it possible, based on current research to establish a strong positive relationship between technological innovation and the growth of digital entrepreneurship? Is there scholarly consensus?

RQ2: Is technological innovation the most important factor for digital entrepreneurship or should it be combined with other factors?

RQ3: Is digital entrepreneurship genuinely generating quality and sustainable employment?

Methodology

Before seeking primary information, it is essential to save economic costs and time by undertaking specific research that allows us to discover the information generated previously by other authors in relation to the subject studied.

Secondary sources of information are fundamental in the exploratory phases of any investigation. In the research conducted here, this process is very important. The main research question focuses on existing knowledge about digital entrepreneurship. Therefore, a rigorous, robust, SLR will guarantee reliable results.

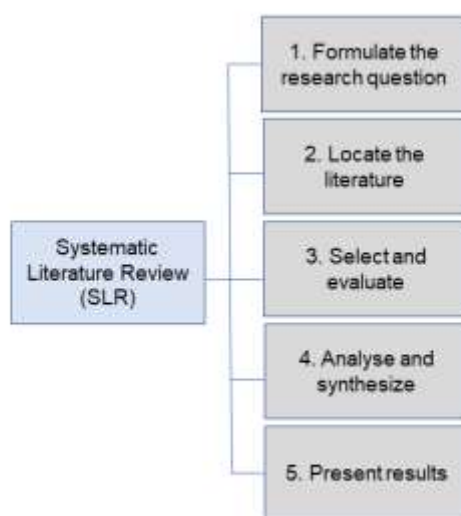
Traditional ‘narrative’ reviews frequently lack thoroughness, and in many cases are not undertaken as genuine pieces of investigatory science. Consequently, they can lack a means of making sense of what the collection of studies is saying (Tranfield et al., 2003: 2007). These reviews can be biased by the researcher and often lack rigour. The literature review is an appropriate methodology to achieve the proposed objectives as it is a crucial stage in structuring a field of research, creating a robust basis for advancing knowledge, facilitating the development of theory, closing areas of research, and discovering areas where further research is needed (Núñez et al., 2020).

In conclusion, the methodology used to identify, select, and evaluate the available research is a SLR. This choice is justified by the fact that this methodology provides robust results by adopting replicable, scientific, and transparent processes, and it improves the quality of the review process and outcome by employing a transparent and reproducible procedure (Tranfield et al., 2003; Denyer and Tranfield, 2009). In addition, this type of review, following the phases proposed by Tranfield et al. (2003) and Denyer and Tranfield (2009), has been used in the social sciences (Núñez et al., 2020) and more specifically in studies focused on the topic of entrepreneurship (Atalkina and Schmitz, et al., 2017; Secundo et al., 2020; Zaheer et al., 2019).

Following the process suggested by Tranfield, the research proposed here establishes prespecified relevance and quality criteria to select/include studies, which is shown to the readers. Moreover, an SLR is replicable, scientific, and transparent, to minimise researcher bias. Value judgments must be eliminated or minimised at least (Denyer and Tranfield, 2009)

The SLR conducted here follows the five stages proposed by Tranfield et al. (2003) to ensure rigour and avoid researcher bias in the process, consequently producing relevant, innovative, and reliable information.

Fig. 1. Stages of the SLR



Stage 1. Formulate the Research Question

This stage is the approach of the questions that were defined in the previous section, the theoretical framework. That is, the three research questions of the study.

Stage 2. Locate the literature:

This stage looked to locate the appropriate and accurate literature to answer the research question (Denyer and Tranfield, 2009). Two instruments were used to guarantee these two key factors, and to ensure both propriety and accuracy during the process: search engines and search word strings. It was not deemed necessary to use hand-searching or conduct searches of specialist bibliographies.

The initial aim of the search was to identify all relevant studies and cover a range of different types of information. All the categories were included (article, review, paper, conference, letter) in every database. As a result, all research related to digital entrepreneurship and innovation technology was included in this first step, since avoiding the selection of some studies related to the aim of the paper could produce inadequate or irrelevant results. The searches need to adhere closely to the review questions, and all this literature must also be accurate, conforming exactly to the required standard by defining by a precise criterion (Denyer and Tranfield, 2009; Tranfield et al., 2003).

The method used to find the papers (database searches) is described in detail in the following sections. The search began with databases using search strings, grouping keywords, and applying search conventions. In order not to miss important information, not only were electronic database searches conducted, but other methods were also included, such as information from experts and cross-referencing (Denyer and Tranfield, 2009)

Search engines

The databases used were Scopus and Web of Science. These are two of the most popular databases in the academic world, where the majority of relevant studies are indexed. Different conventions were used for each database (Denyer and Tranfield, 2009).

Keywords

To select the most appropriate set of keywords to achieve our research objectives and answer the research question, two methods were used: brainstorming and pilot test search. The main objective was to delimit the study area as precisely as possible, so that no relevant publication was missed. The following keywords were taken as the starting point: digital entrepreneurship, technological innovation. These are considered the core keywords, and all related keywords would be deduced from them.

Starting from each of the core keywords, a brainstorming process was performed by the authors. Tools such as Google Keyword Planner were also used to search for keywords from Adwords, Semrush, and Ubbersuggest.

Subsequently, multiple search tests were conducted both in Scopus and WOS to find related keywords that other authors have used in publications directly related to the subject of our study. At the end of the process, a total of 42 keywords were collected:

- **Digital entrepreneurship keyword group:** technological entrepreneurship; technological entrepreneur; digital entrepreneurship; digital entrepreneur; digital business entrepreneurship; digital start-up; internet start-up; digital intrapreneurs; digital tech company; digital first business; digital business entrepreneur; digital entrepreneurship opportunities; digital entrepreneur business; become a digital entrepreneur; entrepreneur marketing digital; marketing digital entrepreneur; global digital entrepreneur; employment.

- **Technological innovation keyword group:** technological innovation; tech innovation; technology innovation; digital innovation; digitalisation; digitalisation ecosystems; digital transformation; disruptive technology; new technology invention; technology; innovation; tech innovation; invention of innovation; emerging disruptive technologies; disruptive digital technologies; new disruptive technologies; digital innovation technology; technological innovation; innovative tech ideas; technology innovation in business; innovative digital technology; new innovations in business; digital technology; digital economy; digital economic.

Search string

Following the process defined by Tranfield, a significant amount of time was invested in constructing the search strings, to ensure the most efficient search possible. To this end, simple operators and Boolean operators were used.

The keywords selected were combined to generate two types of search strings: simple and complex. Simple operators were used for simple search strings, specifically “exact phrase”, and Boolean operators (AND, OR) were used for complex search strings. The search strings were designed to find publications that included at least one keyword from each group of keywords, in the following fields: abstract, title, and keyword in Scopus, and abstract, introduction and title in WOS. This guaranteed that the search would find the most relevant studies related to the research question. The search strings were defined and refined by the authors. This process is detailed in the section: locating studies.

The search strings used in Scopus were:

TITLE-ABS-KEY ("technological entrepreneurship" OR "technological entrepreneur" OR "digital entrepreneurship" OR "digital entrepreneur" OR "digital business entrepreneurship" OR "digital start-up" OR "digital tech company" OR "digital first business" OR "digital business entrepreneur" OR "digital entrepreneurship opportunities" OR "digital entrepreneur business" OR "become a digital entrepreneur" OR "entrepreneur marketing digital" OR "entrepreneur marketing digital" OR "marketing digital entrepreneur" OR "global digital entrepreneur" OR "employment") AND TITLE-ABS-KEY ("technological innovation" OR "tech innovation" OR "technology innovation" OR "digital innovation" OR "digitalisation ecosystems" OR "digital transformation" OR "disruptive technology" OR "new technology invention" OR "technology" OR "innovation" OR "tech innovation" OR "invention of innovation" OR "emerging disruptive technologies" OR "disruptive digital technologies" OR "new disruptive technologies" OR "disruptive digital technologies" OR "new disruptive technologies" OR "digital innovation technology" OR "technological innovation" OR "innovative tech ideas" OR "technology innovation in business" OR "innovative digital technology" OR "new innovations in business" OR "digital technology" OR "digital economy" OR "digital economic")

The search strings used in WOS were:

TITLE-ABS-KEY ("technological entrepreneurship" OR "technological entrepreneur" OR "digital entrepreneurship" OR "digital entrepreneur" OR "digital business entrepreneurship" OR "digital start-up" OR "digital tech company" OR "digital first business" OR "digital business entrepreneur" OR "digital entrepreneurship opportunities" OR "digital entrepreneur business" OR "become a digital entrepreneur" OR "entrepreneur marketing digital" OR "entrepreneur marketing digital" OR "marketing digital entrepreneur" OR "global digital entrepreneur" OR "employment") AND TITLE-ABS-KEY ("technological innovation" OR "tech innovation" OR "technology innovation" OR "digital innovation" OR "digitalisation ecosystems" OR "digital transformation" OR "disruptive technology" OR "new technology invention" OR "technology" OR "innovation" OR "tech innovation" OR "invention of innovation" OR "emerging disruptive technologies" OR "disruptive digital technologies" OR "new disruptive technologies" OR "disruptive digital technologies" OR "new disruptive technologies" OR "digital innovation technology" OR "technological innovation" OR "innovative tech ideas" OR "technology innovation in business" OR "innovative digital technology" OR "new innovations in business" OR "digital technology" OR "digital economy" OR "digital economic").

Stage 3. Selecting and evaluating literature

In this stage, the exclusion and inclusion criteria were established and developed to ensure that all publications relevant to our study were included, and all those not related were discarded.

A total of nine inclusion and exclusion criteria were defined:

1. As explained before, the search strings were designed to find publications that had at least one keyword from each of the groups of keywords. The search was conducted in both databases, from 1990 to 2022, and included all types of documents. A total of 513 papers were found, 288 in Scopus, 225 in WOS.
2. The selected time period was from 1990 to 2022. This period was chosen for the purpose of including the earliest investigations on digital entrepreneurship research. The first article about digital entrepreneurship dated from 1990 (Rosenbaum and Cronin, 1993). However, in the WOS database, the earliest articles found dated from 1994.
3. This first article, mentioned above, was cited by a further nine articles. To conduct a rigorous process and not miss any important information, we decided to check whether all nine related articles were included in the first search string. Some of them were not included, so we decided to add new keywords to the global search string, to incorporate these articles. 24 papers were included after this, 11 from WOS and 14 from Scopus.
4. These nine research papers were also cited by other investigations, giving a total of 134 more papers. Following the same process as before, the search string was increased with more keywords to include all these investigations and related papers.
5. After applying the new exclusion and inclusion criteria, a total of 887 papers were found, 507 in Scopus, 380 in WOS.
6. Only articles published in English were considered in the study.
7. All the papers were filtered by type of document. In Scopus, only articles and reviews were included. In WOS, articles, reviews, and early access contents were included. The rest of them (book chapters, conference papers, etc.) were excluded since they were not considered certified knowledge. Following this step, 182 papers were excluded in Scopus, and 117 in WOS. Finally, 588 papers were selected, 263 in WOS and 325 in Scopus.
8. At this point, we read the title, keywords, and abstract of the 588 papers carefully, to ensure that they tackled an issue related with the research question in depth. After this, 172 papers were discarded from WOS, selecting 91. At the same time, using the same procedure, 245 papers were discarded from Scopus, selecting 80.
9. Studies that were in both databases were also eliminated: 40 papers.

Stage 4. Analysis and synthesis of the results

After all of these previous steps, a total of 131 articles were obtained.

All 131 papers were read in full, and those that did not tackle an issue related to the research question in depth were discarded. A total of 31 papers were discarded from Scopus and 24 from WOS. Three papers had emerged tangentially and were included. As a result, 76 papers were obtained.

Stage 5. Present results

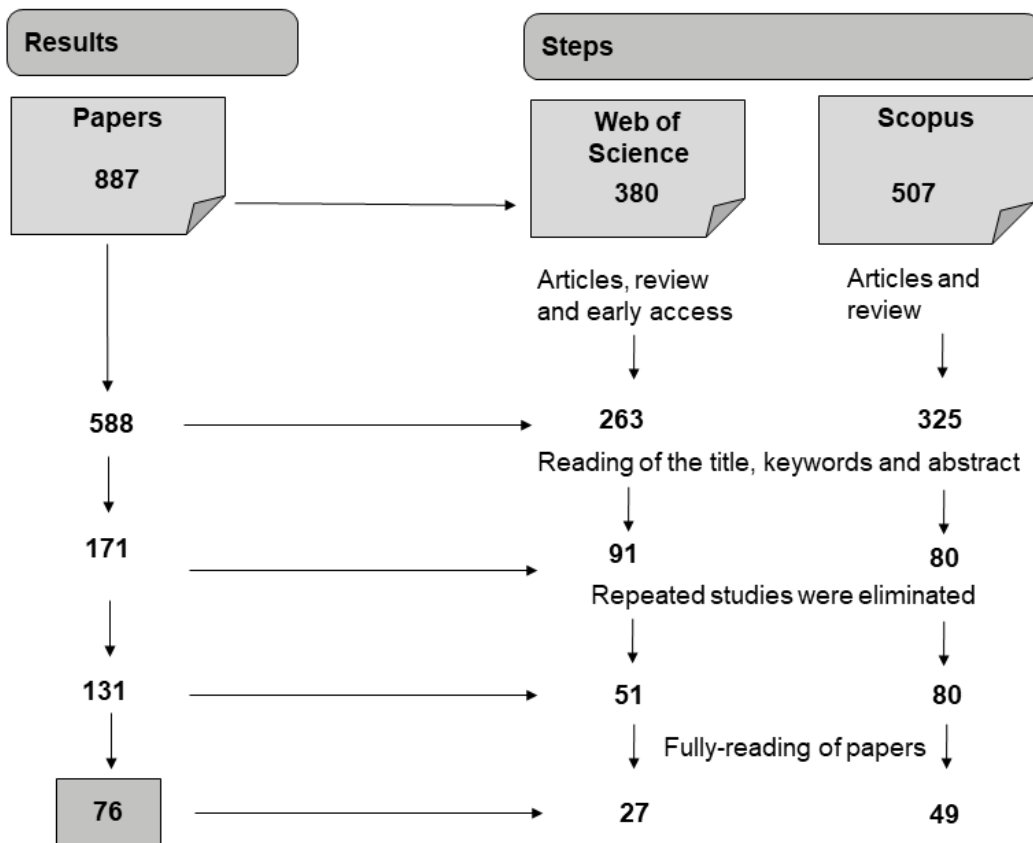
A series of graphs have been drawn up to schematically explain the literature review and the classification of the studies according to the methodology used. 76 papers have also been classified according to different inclusion and exclusion criteria.

Table.1 Summary of the SLR

SUMMARY OF THE SYSTEMATIC LITERATURE REVIEW					
RESEARCH QUESTION	Based on current research, is it possible to establish a strong positive relationship between technological innovation and the growth of digital entrepreneurship compared to other factors?				
SEARCH ENGINE	Scopus; Web of Science (WOS)				
KEYWORDS	<table border="1"> <thead> <tr> <th>DIGITAL ENTREPREUNERSHIP</th> <th>TECHNOLOGICAL INNOVATION</th> </tr> </thead> <tbody> <tr> <td> technological entrepreneurship; technological entrepreneur” digital entrepreneurship; digital entrepreneur; digital business entrepreneurship; digital start-up; internet start-up; digital intrapreneurs; digital tech company; digital first business; digital business entrepreneur; digital entrepreneurship opportunities; digital entrepreneur business; become a digital entrepreneur; entrepreneur marketing digital; marketing digital entrepreneur; global digital entrepreneur. </td> <td> technological innovation; tech innovation; technology innovation; digital innovation; digitalisation; digitalisation ecosystems; digital transformation; disruptive technology; new technology invention; technology; innovation; tech innovation; invention of innovation; emerging disruptive technologies; disruptive digital technologies; new disruptive technologies; digital innovation technology; technological innovation; innovative tech ideas; technology innovation in business; innovative digital technology; new innovations in business; digital technology; digital economy; digital economic. </td> </tr> </tbody> </table>	DIGITAL ENTREPREUNERSHIP	TECHNOLOGICAL INNOVATION	technological entrepreneurship; technological entrepreneur” digital entrepreneurship; digital entrepreneur; digital business entrepreneurship; digital start-up; internet start-up; digital intrapreneurs; digital tech company; digital first business; digital business entrepreneur; digital entrepreneurship opportunities; digital entrepreneur business; become a digital entrepreneur; entrepreneur marketing digital; marketing digital entrepreneur; global digital entrepreneur.	technological innovation; tech innovation; technology innovation; digital innovation; digitalisation; digitalisation ecosystems; digital transformation; disruptive technology; new technology invention; technology; innovation; tech innovation; invention of innovation; emerging disruptive technologies; disruptive digital technologies; new disruptive technologies; digital innovation technology; technological innovation; innovative tech ideas; technology innovation in business; innovative digital technology; new innovations in business; digital technology; digital economy; digital economic.
DIGITAL ENTREPREUNERSHIP	TECHNOLOGICAL INNOVATION				
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SELECTION PERIOD	1990-2022				
SELECTION CRITERIA	9 stages				
STUDIES ANALYSED AND SYNTHESISED	As a result, 76 papers were obtained				
PRESENTATION OF RESULTS	Quantitative				

Source: Authors' own

Fig.2 Summary of the SLR: steps and results.



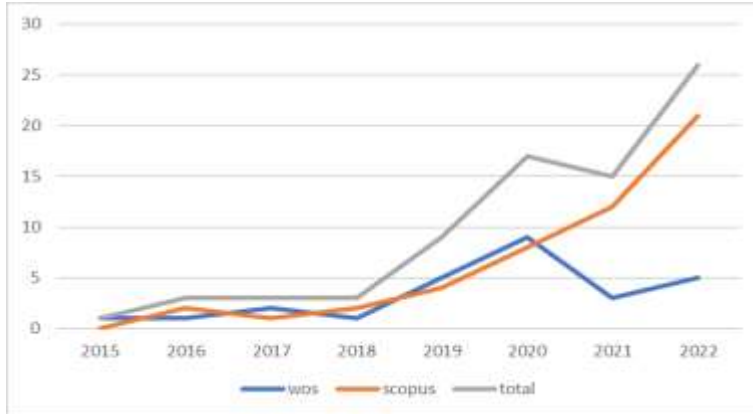
Source: Authors' own

Results

Descriptive Analysis

Firstly, analysis of the studies selected by year of publication shows that interest in the research topic has grown since 2015. Specifically, 60% of the studies were published in the last three years covered. This demonstrates the relevance and novelty of the research topic analysed in this work. (Figure 3).

Fig.3 Time evolution of the investigation



Source: Authors' own

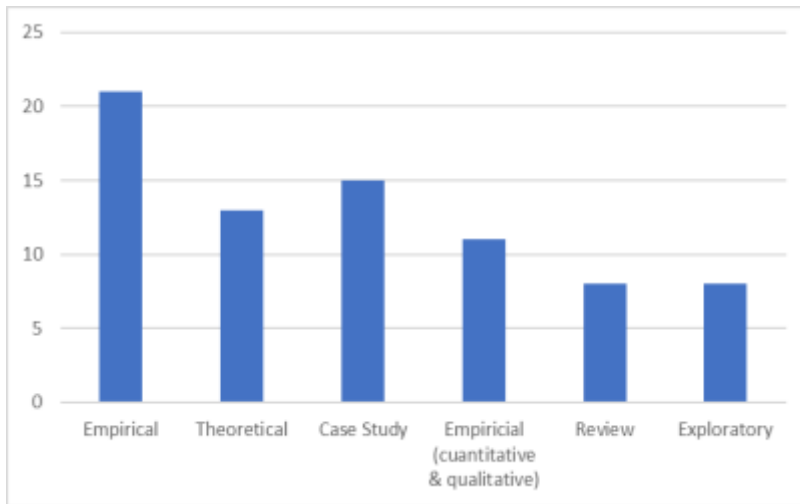
Secondly, regarding the methodology used in the studies analysed, there is a clear observable pre-eminence of quantitative empirical studies. It should be noted that all the qualitative works identified have used the case study method as their research methodology. Exploratory works and reviews have also been identified, mainly focusing on different literature reviews. Table 2 provides these data.

Table.2 Frequency of Methodology type used

Methodology	N° Papers	Frequency
Empirical (Quantitative)	21	27.6%
Theoretical	13	17.10%
Empirical (Qualitative)	15	19.7%
Empirical (Quantitative and Qualitative)	11	14.5%
Review	8	10.5%
Exploratory	8	10.5%
TOTAL	76	

Source: Authors' own

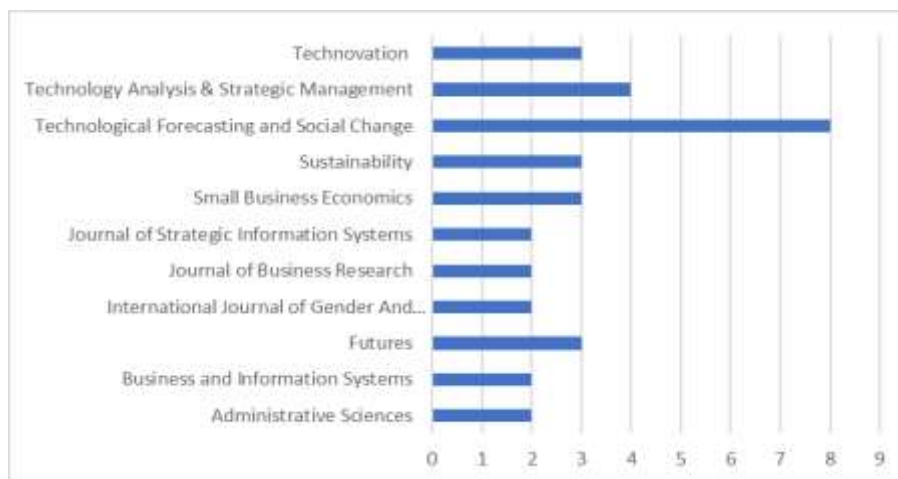
Fig. 3. Graph depicting frequency of Methodology type used



Source: Authors' own

Lastly, regarding the journals where the papers were published, the results were very varied, involving up to 37 different publications. Some of these journals published more than two papers, as shown in the following figure. These are journals that appear indexed in both the WOS and SCOPUS databases, occupying relevant positions in them, which shows the quality of the contributions analysed. Interestingly, the central topic receives significant attention in the journal Technological Forecasting and Social Change, with eight published papers.

Fig. 4: Articles by Journal



Source: Authors' own

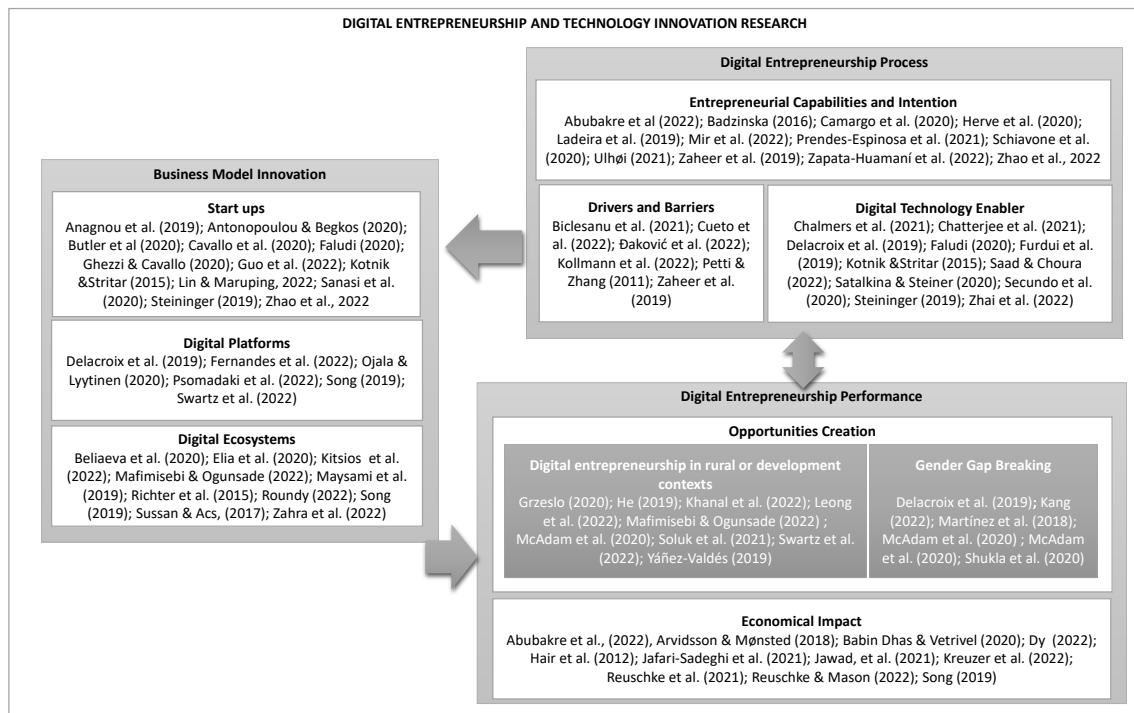
Within the 76 articles selected, the conclusions reached regarding our research question vary. We started with the main question and, from there, we focused on the three questions into which it is divided. Based on current research, is it possible to establish a strong positive relationship between technological innovation and the growth of digital entrepreneurship compared to other factors? And is digital entrepreneurship generating quality employment?

Thematic analysis

Qualitative analysis of the selected works points to three core thematic areas (groups) that highlight different roles for technological innovation in the process of digital entrepreneurship. Specifically: (1) Business Model Innovation, composed of studies about Start-ups, Digital Platforms, and Digital Ecosystems; (2) Digital Entrepreneurship Process, composed of studies about entrepreneurial capabilities and intention, drivers and barriers found in digital entrepreneurship, and another group of studies focused on the use of digital technology as a facilitating tool to develop entrepreneurship; and finally (3) Digital Entrepreneurship Performance, including studies on the results obtained with digital entrepreneurship, not only in terms of economic results, but also in terms of creating opportunities, such as the development of rural areas, of developing countries, or the opportunities created for women.

Figure 5 shows the articles included in each group and subgroup, considering that some papers contribute to more than one group or subgroup.

Figure 5: Studies included in thematic analysis



Source: Authors' own

Business Model Innovation

A group of articles included in the sample focus on Innovation in Business Models fostered through the development of information technologies that give rise to digital entrepreneurship. The specialised literature recognises that this type of entrepreneurship involves making changes within each key element of the business model (consisting of the value offer, value propositions, and revenue model) (Antonopoulou and Begkos, 2020). Specifically, this group of studies focuses on Start-ups, Digital Platforms, and Digital Ecosystems.

Regarding the first of the subgroups related to Start-ups, some of the research identified analyses the decision-making process within a digital start-up (Anagnou et al., 2019). Ghezzi and Cavallo (2020) examine the way digital start-ups innovate their business

models by leveraging emerging practices that are more agile and leaner. Butler et al. (2020) analyse the factors that influence decisions to launch a start-up in a particular location. In short, the creation of start-ups is considered a good measure of digital entrepreneurial activity (Kotnik & Stritar, 2015).

The second subgroup identified refers to Digital Platforms. Digital platforms increase interest in digital entrepreneurship (Delacroix et al., 2019; Psomadaki et al., 2022). To build a successful platform, entrepreneurs must pursue indirect network effects and shape multiple sides of the platform (Ojala and Lyytinen, 2020).

Regarding the Digital Ecosystems subgroup, the papers dealing with this topic focus on exploring the complex and dynamic nature of digital entrepreneurship. Authors such as Beliaeva et al., (2019) analyse the actors and interactions that make up an innovation ecosystem, that is, how a company adapts by capturing value from external actors through networked partners in innovation ecosystems, and how a company exploits opportunities by configuring its internal resources and external strategic relationships in the ecosystem. The development of digitisation gives rise to the creation and growth of different types of new venture, which play several crucial and complementary roles that keep the entrepreneurial ecosystems competitive (Zhara et al., 2022).

Digital Entrepreneurship Process

In this group, studies are dedicated to understanding certain aspects of the Digital Entrepreneurship Process based on entrepreneurial abilities and intention, drivers and barriers, and the study of Digital Technology as a facilitator of digital entrepreneurship.

Regarding capabilities, information technology (IT) culture is an essential predictor of success in digital entrepreneurship (DE), a relationship that is moderated by experience in IT projects (Abubakre et al., 2020). In addition, the degree of digital transformation affects companies' entrepreneurial intention (Hervé et al., 2020). Authors such as Ladeira et al. (2019) specify the determining factors for success in digital entrepreneurship, which include: Human Resources, Financial Resources, Strategy, Business Model, Planning, Technology and Equipment, Entrepreneur Profile, and External Factors.

Regarding the Drivers and Barriers for digital entrepreneurship, Petti and Zhang (2011) consider that the development of digital entrepreneurship is influenced by four main categories of factors: internal capabilities, external networks, institutions, and overall environment.

In short, this group of works clearly shows that digital entrepreneurship today stems from the emergence of digital technology as the first significant enabler of digital venture creation (Kollman et al., 2022).

Digital Entrepreneurship Performance

This group encompasses studies that analyse the results obtained with digital entrepreneurship, taking into account not only the achievement of economic results, but also the opportunities generated with this type of entrepreneurship, as regards developing countries or rural areas, and the opportunities generated to overcome the gender gap and inequalities for women.

Thus, the first of the subgroups refers to the creation of opportunities in developing countries or in rural areas. The identified works show that digital entrepreneurship offers great opportunities, especially linked to growth through innovation that improves the quality of life of the population (Yáñez-Valdés, 2022). Digital technologies offer unique entrepreneurial opportunities to overcome the major challenges of poverty in emerging markets (Soluk et al., 2021). Authors like Jawad et al. (2021) state that digitalisation has restored business in China, India, Brazil, Russia, Mexico, Indonesia, Turkey, Thailand, South Africa and Malaysia. However, that progress is strongly conditioned by political, financial, and social factors.

The second subgroup includes works that analyse the opportunities generated by digital entrepreneurship for women. Authors such as Shukla et al. (2020) demonstrate that women who have internet skills have greater intentions of becoming an entrepreneur.

Thus, the e-commerce web-space can use the results to influence women from younger generations to use available tools in their entrepreneurship journey. These results are similar to those obtained by McAdam et al. (2020) for a different country.

Ladeira et al. (2019) demonstrate that digital entrepreneurship is seen by many countries as a fundamental pillar of economic growth, especially since this form of entrepreneurship helps create jobs. In short, digital entrepreneurship involves the generation of multiple opportunities, in addition to economic ones (Kreuzer et al., 2022; Reuschke and Mason, 2022).

Discussion

The results of our research show that 61% of the studies analysed answer the first research question in the affirmative. Therefore, *it is possible, based on current research, to establish a strong positive link between technological innovation and the growth of digital entrepreneurship*. The question is addressed from different perspectives, but the final consensus is that there is a strong positive link between these two factors. The link between innovation and digital entrepreneurship is directly proportional. More technological innovation means more digital entrepreneurship.

From the review, it is clear that innovation technology alters and transforms social and market structures, lowering barriers and generating endless business opportunities. Technological innovation creates an ecosystem in which products, processes and services flow, driving digital entrepreneurship. Uber, eBay, YouTube... internet-based companies have grown exponentially, compared to traditional businesses (Ulhøi, 2021). This phenomenon particularly affects rural areas of developing countries.

Specifically, a large number of authors consider that technological innovation increases revenues, and creates new business models, competitive advantages, and lower costs. In addition, it reduces the risks and costs of launching new business, lowers entry barriers, and is more environmentally friendly (Akhter et al., 2022). We can affirm that innovation technology has created a modern society where it is easier to be entrepreneurial, and the challenges for firms have multiplied (Beliaeva et al, 2019). Setting up a new business is easy; you just need to use a digital platform such as YouTube or Facebook. Backing from a financial institution or private funding, as was the case in the pre-digital age (Babin et al., 2020), is no longer necessary. Some research highlights the greater capacity to generate income with little investment compared to traditional businesses.

Nevertheless, a small group of authors argues that technological innovation is not considered the fundamental factor for the growth of digital entrepreneurship. Specifically, authors such as Reuschke and Mason (2022) maintain that the opportunities to trade digitally have facilitated some home-based business activities. However, to single out digital technologies as the main driver of home-based businesses would be an exaggeration, particularly in certain economies such as rural economies. These researchers claim that the impact of digital technologies on entrepreneurship are fundamentally small. In particular, online business models and online marketplaces such as eBay or Amazon have a much smaller impact on this digital transformation. Other authors such as Church and Oakley (2018) or Luckman (2015) criticise the widespread belief that technological innovation has driven digital entrepreneurship, arguing that, particularly in underrepresented social groups (women, older people, disabled people) or in poor or rural areas, its influence has been exaggerated by the media and related literature.

Despite this, 46 of the 76 studies analysed in the SLR answered the first research question in the affirmative, which leads us to conclude that technological innovation is the main driver of digital entrepreneurship. These results are consistent with previous studies such as those performed by Steininger (2019) or Elia et al. (2020), inter alia.

Regarding the second of the Research Questions proposed in our review: *is technological innovation the most important factor for digital entrepreneurship, or should it be combined with other factors?* Analysis of the identified works shows that, despite all the facilities that innovation technology offers entrepreneurs, there are other factors that may impact digital entrepreneurship. Research has demonstrated that factors like family and community, digital culture, creativity and innovation, infrastructures, and digital knowledge and skills can influence the decision to become a digital entrepreneur. All of these are analysed below:

Family and Community: authors highlight the impact of community and family support on the growth on digital entrepreneurship. These two factors are essential to decide whether to launch a new business, grow that business and maintain it over time. The SLR performed shows that this factor is really important in rural areas (Soluk et al., 2021). Digital enterprises in rural areas use digital technology to test out products and services among the community or family members. Thus, entrepreneurs tend to launch new enterprises in places where they have strong ties with family and community, especially in the early stages (Butler et al., 2020).

This support might be considered from different perspectives, and it depends on the environment and whether the country is developed or not. On the one hand, for entrepreneurs in developing countries, financial support is more important than other types. In these countries, start-ups receive funding from friends and family rather than from business angels or venture capital investors (Butler et al., 2020). On the other hand, in wealthier countries with a different culture, such as Muslim countries, digital entrepreneurs, especially women, seek recognition and approval from their family and the community, more than financial support (McAdam et al., 2020).

Digital culture is defined as a set of customs and behaviours created as a result of our relationship with technology. According to the SLR, this is an important factor in achieving digital entrepreneurship success (Abubakre et al., 2020). In addition, digital culture is a prominent part of the innovation system (Satalkina and Steiner, 2020).

According to the results, **digital knowledge and digital skills** are key factors for digital entrepreneurship. Therefore, most authors consider both of these to be among the most important elements for becoming a digital entrepreneur. Results confirm that a lack of digital skills and knowledge is a major barrier for launching a new digital business. Researchers have shown that students with entrepreneurial backgrounds and digital skills are willing to become digital entrepreneurs (Shukla, et al., 2021). Thus, a potential entrepreneur has technology skills and access to IT infrastructure (Martínez et al., 2018). The use of digital technology in entrepreneurship must be seen as a means-to-an-end, where many elements are interconnected (Ulhøi, 2021). Highly skilled employees, and those in ICT occupations, are more likely to become entrepreneurs. Fossen and Sorgner (2019) highlight that IT access and IT knowledge capabilities are very important in enabling digital entrepreneurship. In addition to this, a high level of digital knowledge management increase the sustainability of the firms. (Martínez-Navalón et al.,2022)

Creativity is an important factor in digital entrepreneurship. It is considered the motivation of entrepreneurial intention and shows a high level of entrepreneurial desirability (Chia and Liang, 2016). Creativity plays a significant role in the process of entrepreneurial intention, since highly creative people can create and maintain self-confidence in their entrepreneurship (Zhao et al., 2005). Some studies, focusing on developing countries, confirm this idea. For example, authors such as Akhter et al. (2022) confirm that creativity and innovation have a positive and significant impact on students' intentions to engage in online entrepreneurship. Innovativeness displays a positive and significant relationship with entrepreneurial intentions (He, 2019).

As regards **Technological infrastructure**, findings show that a lack of infrastructure access might be a barrier to digital entrepreneurship. Access to robust IT infrastructure is highlighted by many authors as a technological resource (Biclesanu et al., 2021; Ladeira et al., 2019).

Finally, **Economic, political, and social context** influence the decision to become a digital entrepreneur. It is important to recognise the contextually embedded quality of entrepreneurial actions and behaviours nationally, regionally, and within cities. The specific local or regional context is important because industries might be structured differently in each case.

Government initiatives aimed at promoting digitisation are seen to foster entrepreneurship in developing countries by providing greater opportunities for entrepreneurs and creating an attractive entrepreneurship ecosystem (Jawad et al., 2020), a critical aspect in developing countries. The systematic review confirms that, in developing countries, the main drivers are infrastructures, digitally competent human resources, promotional policies, and access to start-up funds. These results are consistent with those found in Biclesanu et al. (2021).

Regarding the third research question, the review performed shows that digital entrepreneurship is considered one of the best ways to solve unemployment at every level of society and a tool to alleviate poverty in developing and developed countries. But is this form of self-employment stable and does it offer possibilities for growth?

Findings reveal that digital entrepreneurship is a great vehicle for generating employment and self-employment, but they also show that this employment is not always high quality. In addition, there is a general dearth of research in this field. Based on the literature available, it is very difficult to identify how much of the employment generated is good quality and how much could be classed as subsistence employment. Even so, it is possible to reach some conclusions through the studies analysed.

Digital entrepreneurs are usually seen as young people, well-educated, with high-level technical and business skills in terms of using digital platforms and launching start-ups (Zaheer et al., 2019; Fernandes et al., 2022). However, recent studies identify digital subsistence entrepreneurs as a new type of entrepreneur that recently appeared in developed countries. Specifically digital platforms, like P2P platforms, have become places where subsistence opportunities can be found (Delacroix et al., 2018). This new way of doing business seems to be providing deprived populations with the social capital they lack and structuring new opportunities for markets that sell goods. Hence, new technologies facilitate digital entrepreneurship, but the employment generated is not highly skilled. Furthermore, subsistence entrepreneurs will never go on to expand their business beyond the small scale that allows them to improve their daily living conditions (Delacroix et al., 2018). It is important to emphasise that this kind of precarious employment has been found in developed countries. Some authors relate this phenomenon to social class and income, and the gender or race of the entrepreneur (Church and Oakley, 2018; Luckman, 2015). Even if the potential entrepreneur has technology skills and access to IT infrastructure, there are other invisible barriers raised by certain social structures, meaning that the internet is a place that offers unequal opportunities for entrepreneurship (Martínez et al., 2018).

Regarding digital entrepreneurship specialising in the use of digital platforms, it is possible to identify another group of digital entrepreneurs. These entrepreneurs have appeared recently in developed countries, and they are popularly known as content creators. They use digital P2P platforms to create content and make themselves known. The review performed shows that the development of digital economies, digital environments, and the digital collaborative culture has enabled the rise of entrepreneurial-like content creation and distribution through digital platforms. Amateur video content creation by private individuals (such as in YouTube and Twitch) has become a popular area for such forms of hybrid entrepreneurship, which is afforded by digital platforms (Törhönen et al., 2021).

CONCLUSIONS

Digital technologies have generated digital entrepreneurship. This kind of entrepreneurship is seen by society as a driver of employment and economic growth, especially in recent years. Accordingly, the relationship between innovation technology and digital entrepreneurship has been studied by the research community, aiming to explain how technology has impacted digital entrepreneurship and boosted employment. This paper performs a SLR that seeks to answer three research questions: whether a strong positive link may be established between technological innovation and the growth of digital entrepreneurship; whether technological innovation is the most important factor for digital entrepreneurship or whether it should be combined with other factors, and whether digital entrepreneurship is generating quality and sustainable employment.

In relation to the first of the research questions raised, the literature is conclusive, with a significant number of authors confirming that technological innovation is considered the fundamental factor for the growth of digital entrepreneurship. Recent investigation has confirmed, as has research from the European Commission, the importance of ICT investment and usage by both businesses and households as drivers of technology-driven entrepreneurship.

Besides innovation technology, the second research question shows that there are other outstanding drivers of digital entrepreneurship: digital skills and knowledge, digital culture, support from primary reference groups (family and community), creativity, infrastructure and social, political, and economic context, inter alia. It is important to highlight that digital skills and digital knowledge are considered by most authors to be one of the most important elements in digital entrepreneurship. Despite all

the facilities that innovation technology provides entrepreneurs, many firms lack the knowledge to develop digital entrepreneurship initiatives. One of the reasons might be the rapid evolution of ICT, that make it difficult for employees to learn in the short term. Such a drawback is one of the creators of *technostress* (Martínez-Navalón et Al.,2022) and impacts both employees and digital entrepreneurs.

Regarding the last research question, the results are inconclusive as to whether digital entrepreneurship generates quality employment, or whether the Internet is an unequal space, and the success of digital entrepreneurship differs depending on the environment surrounding the entrepreneur. In general, there is a lack of research about people undertaking entrepreneurial activities online. The dynamic nature and increasing variety of digital entrepreneurship activity is still underexplored and under-theorised, and its interaction with social marginality and unequal resource distribution even less so.

Nonetheless, there is undoubtedly a growing trend towards entrepreneurial activities that generate an online survival economy. This trend could be alleviated by combining technological innovation with other factors such as policies that promote digital entrepreneurship and assistance for people with less income to start a business. In short, the creation of an ecosystem that has all the necessary agents to promote entrepreneurship.

Another interesting question would be to explore a new theory of entrepreneurship, given the new digital context that has changed the entire panorama for entrepreneurship. For instance, digital subsistence entrepreneurs differ from the entrepreneurs classically described by Schumpeter and contemporary authors, because this form of entrepreneurship is not deliberate and is not pursuing business opportunities.

Implications for research and practices

The work presented here has important implications for both theory and practice. From a theoretical point of view, the review performed has identified different core thematic areas (groups), showing different roles for technological innovation in the process of digital entrepreneurship, which could guide future research in this area. In addition, not only has the relationship between technological innovation and digital entrepreneurship been clarified, but important factors that affect the development of this type of entrepreneurship have also been identified, which may lay the foundations for theoretical development of this research topic.

From a practical point of view, this review has important implications since, according to the results of the study, not only must policymakers invest in technological innovation but also focus on education and public programmes for acquiring digital competences. Programmes aimed at young people and older people who wish to start small businesses on digital platforms. Additionally, policies must seek to strengthen small digital businesses beyond a subsistence economy.

Another important measure would be to promote digital culture in countries, and to endorse digital entrepreneurship as a livelihood.

Future lines of research

The SLR presented above has not only provided answers to the research questions proposed, but also identifies important lines that could guide future research in this field.

Firstly, regarding innovation, one future line of research could be to evaluate how recent innovation might affect digital entrepreneurship, in terms of impact on existing business models, opportunities, and fast scalable growth.

Another interesting field of research would be to explore a new theory of entrepreneurship. Future research might focus on new theories of entrepreneurship addressing such new forms of entrepreneurial activity.

Thirdly, it might be interesting to investigate how cultural differences across countries might influence the adoption of digital entrepreneurship. It is also important to investigate specific categories of digital entrepreneurship drivers and their relationships with demographic variables. Culture and religion might also impact digital entrepreneurship, an interesting field that is currently under-researched.

As indicated by the SLR, digital knowledge and digital skills are key factors for digital entrepreneurship. So, future research should perhaps examine the specific capabilities required for the best use of digital technologies.

In addition, further research is needed about online entrepreneurial activities to identify new trends in the subsistence economy or in entrepreneurial success and the impact on the economy. From a social perspective, more research is required in areas such as the lack of equality in access to the Internet and its implications for entrepreneurship, and to explain why the 'emancipatory' effects of digital technologies on disadvantaged social groups are lower than expected.

Finally, regarding digital entrepreneurship among women, there is lack of research with a gender focus, and further investigation is also required to examine this issue through the lens of social class and race. In addition, it might be interesting to analyse how the conditions of self-employment could be improved through digital technology and how subsistence entrepreneurship could be boosted so as to seek opportunities for growth.

Limitations

The first limitation relates to cross-country cultural differences. The research has not considered the different cultures of entrepreneurship that exist in each country. Future studies should consider the differences between countries to be gain more precise results.

Another limitation is not considering the weight of every factor in the entrepreneurial ecosystem. Studies of a quantitative and qualitative nature should be conducted for further research.

In addition, analysis of the factors that promote entrepreneurship is conducted from a post-structuralist perspective, not taking into account the personal qualities intrinsic to the person.

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APPENDIX

Table A1: Business Model Innovation – Start-ups

Authors	Geographic area	Sector	Methodological approach	Main goal of the paper
Anagnou et al. (2019)	N/D	IT Companies	Empirical (cuantitative & cualitative)	To analyse the role of causation and effectuation as the underlying behavioural patterns of an entrepreneur's decision-making processes during business model development changes
Antonopoulou & Begkos (2020)	United Kindong	Multiplatform games, applications	Empirical (qualitative)	To explore the mechanisms that digital entrepreneurs use to design and redesign value propositions to exploit market opportunities
Butler et al (2020)	USA	Service	Empirical (cuantitative)	To estimate the role of social networks and funding opportunities in a location on entrepreneurs' decisions to create a start-up in their existing or a new location
Cavallo et al. (2020)	Italia	Multisector	Empirical (cuantitative)	To investigateinvestigating how angel groups and venture capital (VC) funds affect growth of digital new ventures in their startup and scaleup phase
Faludi (2020);	N/D	N/D	Empirical (cuantitative & cualitative)	To analyse the potential for Social Value Frame (PSVF) method.
Ghezzi & Cavallo (2020)	N/D	N/D	Empirical (qualitative)	To explore how Lean Start ups act as agile methods for Business Model Innovation in Digital Entrepreneurship.
Guo et al. (2022);	China	Digital Start-ups	Empirical (cuantitative)	To investigate how business model innovation contributes to digital start-up performanc
Kotnik & Stritar (2015);	Eslovenia	Start-ups	Empirical (cuantitative)	To analyse the impact of ICT on entrepreneurial activity.
Lin & Maruping (2022)	N/D	Start-ups	Empirical (cuantitative)	To investigate how the engagement in OSC may affect the value of digital startups and how the effect is contingent on the stage of venture maturity (conception, commercialization, or growth)
Sanasi et al. (2020)	worldwide	Start ups colaborativas	Empirico (cuantitative)	To Propose an original framework, definition, and classification of SE startups.
Steininger (2019)	N/D	N/D	Review	To create an overview of the IT-associated entrepreneurship research landscape.
Zhao et al., (2022)	Australia	Multisector	Empirical (cualitative)	To explore how digital entrepreneurs utilize social networks to build their entrepreneurial capability, creating and developing business ventures in a digitally networked society.

Table A2: Business Model Innovation – Digital Platforms

Authors	Geographic area	Sector	Methodological approach	Main goal of the paper
Delacroix et al. (2019)	France	Women entrepreneurs	Empirical (cualitative)	To analyse P2P platforms what provide opportunities for digital subsistence entrepreneurs to cope with poverty in developed countries.
Fernandes et al. (2022)	N/D	N/D	Review	To map academic literature on digital entrepreneurship in order to facilitate a better understanding of antecedents and future work.
Ojala & Lyytinen (2020)	N/D	N/D	Empirical (cualitative)	To sutudy how entrepreneurs orchestrate mechanisms that over time engender indirect network effects on a digital platform.
Psomadaki et al. (2022)	Grecia	música	Empirical (cualitative)	To study the dynamics of new technologies in music entrepreneurship.
Song (2019)	N/D	N/D	Theoretical	To analyse the implications of digital technology on the entrepreneurial ecosystem.
Swartz et al. (2022)	South Africa	Digital platforms start-ups	Review	To examine antecedents of opportunity development among women founders of digital platform start-ups.

Table A3: Business Model Innovation – Digital Ecosystems

Authors	Geographic area	Sector	Methodological approach	Main goal of the paper
Beliaeva et al. (2020)	Brasil	IT Companies	Empirical (cuantitative & cualitative)	To investigate the dynamics of digital entrepreneurship and the role of innovation ecosystem in its shaping by applying a multilevel perspective on the phenomenon.
Elia et al. (2020)	USA	IT Companies	Exploratory	To propose a definition of digital entrepreneurship ecosystem by highlighting the integrated digital-output and digital-environment perspectives
Kitsios et al. (2022)	N/D	Thessaloniki's open data ecosystem	Empirical (cualitative)	To identify the challenges participants of open data hackathons can face to present a model that will support the improvement of these contests
Mafimisebi & Ogunsade (2022)	Africa	N/D	Exploratory	To explore opportunities and the challenges of digital economy in Africa
Maysami et al. (2019)	N/D	N/D	Theoretical	To define ecosystem of digital entrepreneurship
Richter et al. (2015)	N/D	N/D	Exploratory	To analyse the possibilities offered by smart cities for entrepreneurship
Roundy (2022)	N/D	N/D	Review	To review opportunities offered by digital ecosystems for entrepreneurship
Song (2019)	N/D	N/D	Theoretical	To analyse the implications of digital technology on the entrepreneurial ecosystem.
Sussan & Acs, (2017)	N/D	N/D	Theoretical	To analyse a conceptual framework for studying entrepreneurship in the digital age by integrating two well-established concepts: the digital ecosystem and the entrepreneurial ecosystem.
Zahra et al. (2022)	N/D	N/D	Exploratory	To analyse how digital technologies foster the birth, development and growth of new ventures and how these firms employ these technologies to shape the evolution of their ecosystems.

Table A4: Digital Entrepreneurship Process - Entrepreneurial Capabilities and Intention

Authors	Geographic area	Sector	Methodological approach	Main goal of the paper
Abubakre et al (2022)	Nigeria	Digital entrepreneurs operating in the Yabacon Valle	Empirical (cuantitative)	To analyse a research model that takes information technology (IT) culture as a theoretical lens and personal innovativeness, and experience in IT projects as theoretical constructs to predict behaviour and traits that explain DE success.
Badzinska (2016)	Poland	IT Companies	Empirical (cualitativa)	To identify the role of factors influencing the development of technological entrepreneurship.
Camargo et al. (2020)	N/D	N/D	Review	To realize a quantitative mapping of important players of the recent research of entrepreneurship, specifically the approaches of sustainable entrepreneurship, social, cultural, female and digital.
Herve et al. (2020)	Suecia	PYMES	Empirical (cuantitative)	To investigate how the digital transformation of PYMES will support decision-makers in international businesses.
Ladeira et al. (2019)	N/D	N/D	Empirical (cualitativa)	To identificate and analyse of the determinants of digital entrepreneurship and their cause-and-effect relationships.
Mir et al. (2022)	N/D	Students	Empirico (cuantitative)	To identify major antecedents of digital entrepreneurship intentions under the aegis of capital theory.
Prendes-Espinosa et al. (2021)	Europe	Students	Empirical (cualitativa)	To analyse entrepreneurship and digital skills among young people
Schiavone et al. (2020)	N/D	N/D	Exploratory	To analyse the process of digital entrepreneurship.
Ulhøi (2021)	N/D	N/D	Theoretical	To re-examine theory on digital technologies and theory on entrepreneurship while at the same time asking where to find critical bridging points that may allow for integrating the two domains.
Zaheer et al. (2019)	N/D	N/D	Review	To provide a structured literature review of digital entrepreneurship to generate insights into recent developments in the field, critique the research to date, and identify opportunities for future research.
Zapata-Huamani et al. (2022)	South America	University	Empirical (cualitativa)	To analyse the role of the university as a contextual determinant of technological entrepreneurship. Second is to study how a set of regional factors can shape the effect of universities on technological entrepreneurship.
Zhao et al., 2022	Australia	Multisector	Empirical (cualitativa)	To explore how digital entrepreneurs utilize social networks to build their entrepreneurial capability, creating and developing business ventures in a digitally networked society.

Table A5: Digital Entrepreneurship Process - Drivers and Barriers

Authors	Geographic area	Sector	Methodological approach	Main goal of the paper
Biclesanu et al. (2021)	Rumania	N/D	Empirical (cuantitative)	To asses the public perception of digital entrepreneurship, with a focus on its barriers, drivers, and expectations for the future.
Cueto et al. (2022)	Filipinas	Young entrepreneurs	Empirical (cuantitative & cualitativa)	To explore drivers and barriers to digital innovations in micro, small, and medium enterprises (MSMEs) during economic disruptions.
Daković et al. (2022)	Serbia, Montenegro, Hungary, Bosnia	N/D	Empirical (cuantitative & cualitativa)	To analyze the part of the context in which the entrepreneurial process takes place.
Kollmann et al. (2022)	N/D	N/D	Theoretical	To analyse the terminological history of digital entrepreneurship and what role digital technologies play in it.
Petti & Zhang (2011)	China	N/D	Review	To explain technological innovation in Chinese enterprises.
Zaheer et al. (2019)	N/D	N/D	Review	To provide a structured literature review of digital entrepreneurship to generate insights into recent developments in the field, critique the research to date, and identify opportunities for future research.

Table A6: Digital Entrepreneurship Process - Digital Technology Enabler

Authors	Geographic area	Sector	Methodological approach	Main goal of the paper
Chalmers et al. (2021)	Worldwide	Music Industry	Empirical (cuantitative & cualitativa)	To explore blockchain as a focal digital enabler.
Chatterjee et al. (2021)	India	PYMES	Empirical (cuantitative)	To identify the determinants that impact corporate digital entrepreneurship for the small and medium enterprises (SMEs) of India.
Delacroix et al. (2019)	France	Women entrepreneurs	Empirical (cualitativa)	To analyse P2P platforms what provide opportunities for digital subsistence entrepreneurs to cope with poverty in developed countries.
Faludi (2020)	N/D	N/D	Empirical (cuantitative & cualitativa)	To study the potential for Social Value Frame (PSVF) method.
Furdui et al. (2019)	N/D	N/D	Theoretical	To study the models of development of technological entrepreneurship.
Kotnik & Stritar (2015)	Eslovenia	sart-ups	Empirical (cuantitative)	To analyse the impact of IT on entrepreneurial activity.
Saad & Choura (2022)	N/D	Internet users	Empirical (cualitativa)	To test and compare the effectiveness of two virtual reality technologies, the avatar and anthropomorphic virtual agents, on consumers' psychological states and perceived realism.
Satalkina & Steiner (2020)	N/D	N/D	Review	To review the literature on digital entrepreneurship and innovation.
Secundo et al. (2020)	N/D	N/D	Review	To provide an overview of the state of research and outlining a future research agenda about Digital Academic Entrepreneurship
Steinger (2019)	N/D	N/D	Review	To create an overview of the IT-associated entrepreneurship research landscape.
Zhai et al. (2022)	N/D	N/D	Empirical (cuantitative)	To provide a structured review of digital entrepreneurship (DE) to identify status, hotspots, knowledge structure, dynamic trends and future developments in this field.

A7: Digital Entrepreneurship Performance. Opportunities Creation - Digital entrepreneurship in rural or development contexts

Authors	Geographic area	Sector	Methodological approach	Main goal of the paper
Grzeslo (2020)	Kenia	Young entrepreneurs	Empirical (cuantitative & cualitativa)	To explore how the uptake of digital technologies influences youth entrepreneurship in Kenya.
He (2019)	China	N/D	Empirical (qualitative)	To analyse the structure barriers, exclusionary mechanisms and immutable conditions facing persistent rural poverty.
Khanal et al. (2022)	N/D	N/D	Empirical (qualitative)	To analyse how the lens of effectuation and frugal innovation can be employed to understand digital entrepreneurial practices in development contexts.
Leong et al. (2022)	Indonesia	N/D	Empirical (qualitative)	To studie how emancipation can occur through the actions of digital entrepreneurs.
Mafimisebi & Ogunsade (2022)	Africa	N/D	Theoretical	To explore opportunities and the challenges of digital economy in Africa.
McAdam et al. (2020)	Arabia	Women entrepreneurs	N/D	To examine women's engagement in digital entrepreneurship in emerging economies with restrictive social and cultural practices.
Suluk et al. (2021)	India	Microfirms	Empírico (cuantitative)	To study how drawing on the support of various stakeholders—specifically family, community, and business partners—helps overcome institutional voids and foster entrepreneurship in Indian microenterprise.
Swartz et al. (2022)	South Africa	Digital platforms start-ups	N/D	To examine antecedents of opportunity development among women founders of digital platform start-ups
Yáñez-Valdés (2019)	Latinamerica	N/D	Theoretical	To investigate the definitions, measures and methods that have been used to investigate the phenomenon and to define the process of the “entrepreneurial journey” and the associated typologies according to the technological level.

A8: Digital Entrepreneurship Performance. Opportunities Creation - Gender Gap Breaking

Authors	Geographic area	Sector	Methodological approach	Main goal of the paper
Delacroix et al. (2019)	France	Women entrepreneurs	Empirical (cuantitative)	To analyse P2P platforms what provide opportunities for digital subsistence entrepreneurs to cope with poverty in developed countries.
Kang (2022)	USA	Digital Platforms	Empirical (cuantitative)	To know about how women entrepreneurs engage with technologies within the context of digital platforms.
Martínez et al. (2018)	UK	Women entrepreneurs	Empirical (cuantitative)	To examine the relationships between digital entrepreneurship, social positionality, and structural and agential enabling conditions, we interrogate the notion of digital entrepreneurship as an emancipatory phenomenon producing liberated workers.
McAdam et al. (2020)	Arabia	Women entrepreneurs	Empirical (cuantitative)	Examines women's engagement in digital entrepreneurship in emerging economies with restrictive social and cultural practices.
Shukla et al. (2020)	N/D	N/D	Empirical (cuantitative)	To Analyse Women's Emancipation through Digital Entrepreneurship.

A9: Digital Entrepreneurship Performance – Economical impact

Authors	Geographic area	Sector	Methodological approach	Main goal of the paper
Abubakre et al (2022)	Nigeria	Digital entrepreneurs operating in the Yabacon Valle	Empirical (cuantitative)	To analyse a research model that takes information technology (IT) culture as a theoretical lens and personal innovativeness, and experience in IT projects as theoretical constructs to predict behaviour and traits that explain DE success.
Arvidsson & Mønsted (2018)	Norway	Hospital	Empirical (qualitative)	To study how digital entrepreneurs generate potential for innovation in organizations given that even failures may provide potent stepping stones for further action as a result of the increasing malleability of digital technology.
Babin Dhas & Vetrivel (2020)	N/D	N/D	Review	To understand the role and association of various technologies like Cyberspace in entrepreneurship.
Dy (2022)	N/D	N/D	Theoretical	To examine the potential for digital entrepreneurship and selfemployment to decrease social inequality.
Hair et al. (2012)	N/D	N/D	Theoretical	To examine the role of electronic community and communication and how successful digital entrepreneurs takes advantage of electronic community technologies.
Jafari-Sadeghi et al. (2021)	N/D	N/D	Empirical (cuantitative)	To address the effects of digital transformation on value creation through the study of technology entrepreneurship and technological market expansion.
Jawad, et al. (2021)	Developing countries	Digital entrepreneurs	Empirical (cuantitative & cualitativa)	To investigate how entrepreneurs are drawing in with computerized improvements in enterprises, and how digitalization has affected on business enterprise.
Kreuzer et al. (2022)	N/D	N/D	Empirical (cuantitative & cualitativa)	To identify the effects of digital technology on opportunity recognition.
Reuschke & Mason (2022)	Scotland	SMEs	Empírico (cuantitative)	To analyse home-based businesses created through information technology developments.
Song (2019)	N/D	N/D	Theoretical	To analyse the implications of digital technology on the entrepreneurial ecosystem.