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New technologies and entrepreneurship: exploring entrepreneurial behavior in the digital transformation era

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Guest editorial: New technologies and entrepreneurship: exploring entrepreneurial behavior in the digital transformation era

Guest editorial

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Introduction

Digital transformation offers both intriguing challenges and new opportunities for entrepreneurs (Cohen *et al.*, 2017; Li *et al.*, 2018; Troise *et al.*, 2022a). New technologies are spreading throughout the world, contributing to the rapid development and changes in new industries (Aydalot and Keeble, 2018). Among those new, global technologies are artificial intelligence (AI), machine learning, Internet of things (IoT), big data, digital platforms, social media, mobile applications (i.e. apps), cloud computing, blockchain and more (as the Fintech ones, such as ICOs and crowdfunding) (Troise *et al.*, 2022a), the adoptions of which are expected to become increasingly widespread over the next few years.

Digital transformation has had a large-scale impact (Andriole, 2017), and its development favors the creation and diffusion of several new types of entrepreneurships (Oukil, 2011). For example, recent advances in digital technologies have played a key role in growing a new, digital-based entrepreneurship and the development of related business models (Kraus *et al.*, 2019; Nambisan, 2017). These technologies are having a disruptive impact on entrepreneurship, changing traditional patterns and helping discover new frontiers for entrepreneurs to explore (Broomé and Ohlsson, 2018).

A growing number of entrepreneurs are leveraging online social networks to create relationships and exchange knowledge (Scarmozzino *et al.*, 2017). Some studies have investigated the impact of social media technologies on company performance or entrepreneurial opportunities (Ahmad *et al.*, 2019; Troise *et al.*, 2022b) and the importance of the entrepreneurial team (Ben-Hafaïedh *et al.*, 2022; Santos *et al.*, 2019).

Digital platforms are among the modern technologies that entrepreneurs have exploited (Srinivasan and Venkatraman, 2018; Troise and Tani, 2021; Troise *et al.*, 2021; Yablonsky, 2018); they can help develop new business ideas, and many have often focused their business models around the characteristics of the platforms themselves. Further, entrepreneurs also benefit from the competitiveness (especially in terms of cost reduction) related to the emergence of a new technology (Chen and Tian, 2022; Fossen and Sorgner, 2021).

Despite existing research on new technologies in several fields, such as consumer behavior and innovation (Dominici *et al.*, 2016), few studies specifically explore how they are used by entrepreneurs in developing new businesses (Troise *et al.*, 2022b). In entrepreneurship studies, significant gaps remain regarding how these technologies will impact the future of entrepreneurship.

In this special issue, we aim to explore the new entrepreneurial behaviors developed in the digital transformation era. The accompanying technologies influence entrepreneurs and their ventures and significantly affect the entrepreneurial decision-making process.

The authors would like to thank all the authors for the work they have done on writing up the articles for this SI and, particularly, on modifying them based on the reviewers' comments. The authors are also very grateful to the Editor-in-Chief, Professor Paul Jones, for his support, and the whole Editorial Staff for their insightful and practical advice. Thanks also go to the many reviewers for their valuable contributions in terms of both efficiency and effectiveness.



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The extant literature focused on the relationship between entrepreneurship and new technologies is still in its infancy and fragmented, hence this domain remains largely undeveloped (Olanrewaju *et al.*, 2020; Troise *et al.*, 2021). Thus, further study is needed to better understand this relationship, along with the primary factors and entrepreneurial behaviors in the current digital scenario.

The primary purpose of this editorial is to examine the relationship between entrepreneurship and new technologies by proposing a conceptual model (see Figure 1). We aim to add knowledge to the existing literature by shedding light on the strategic potential of new technologies for entrepreneurship. We are specifically interested in contributing to this emerging field by exploring the opportunities for entrepreneurs – deriving from new technologies – to help them face challenges and to navigate environments characterized by volatility, uncertainty, complexity and ambiguity (VUCA) (Troise *et al.*, 2022a).

The continuous innovation process that is intrinsic to new digital technology-related advancements creates new scenarios and highlights the need for established and prospective entrepreneurs to obtain and maintain valuable competences related to these new technologies. The ever-changing nature of this new technological context has created significant uncertainty around the entrepreneurial process in a two-fold manner: (1) new technologies may make existing ones obsolete, thereby reducing the period in which companies can exploit them to gain a competitive advantage; and (2) new technologies may drive some players to disrupt the existing context, changing it in an unforeseen manner and creating new competitive spaces for addressing users' needs (Christensen, 1997). Hence, when entrepreneurs cannot correctly gauge the changes made in this context, the perceived uncertainty makes new ventures less manageable and forces the competitive advantage out of reach.

Concurrently, this new context may prove useful. Nambisan (2017) underlines that new digital technologies have unique characteristics and are crucial to the improvement of entrepreneurial processes and their outcomes – particularly through the involvement of a broader set of stakeholders. New, widespread digital platforms – even with a different, more entrepreneurial adoption of social media technologies – may help the various actors in the new technological context become more embedded in an effective network of relationships that proves useful to access the needed competences to create effective innovations and leverage the new technology.

These technology-related innovations may represent enablers of entrepreneurial opportunities, given their potential to reduce traditional barriers (e.g. between invention and the creation of a new venture) (Aldrich, 2014; Fischer and Reuber, 2011; Steinger, 2019).

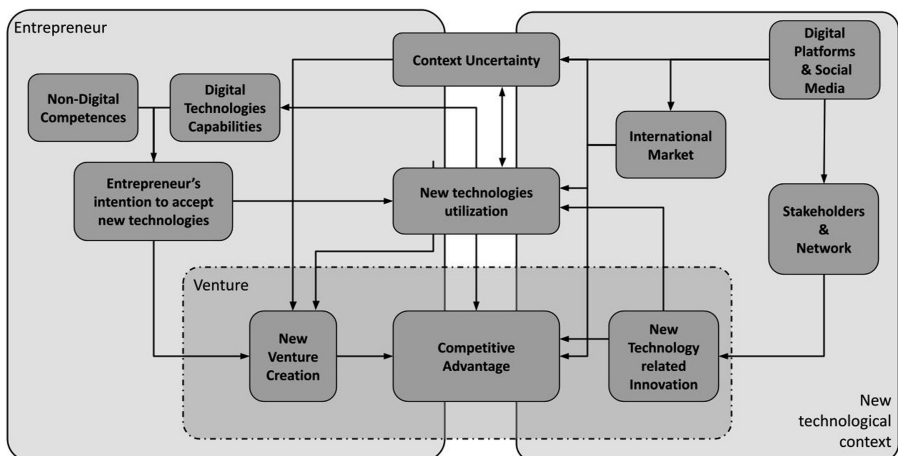


Figure 1.
Conceptual model

Recently, Troise *et al.* (2022b) showed that social media use has a strong and positive impact on entrepreneurial opportunities in terms of opportunity discovery, creation, recognition and resource mobilization. Further, digital technologies and the platform economy together help bridge differences among cultures, creating shared sets of values and perspectives that can foster the creation of stable stakeholder networks while also helping new companies achieve improved competitive standings, thus increasing their chances at success.

By contrast, new technologies may increase the environmental uncertainty perceived by entrepreneurs (Chen and Tian, 2022), thus hindering their propensity to create new ventures or change existing ones. However, when adopted, these new technologies may help entrepreneurs improve their knowledge set and may therefore improve their chances of developing an entrepreneurial process in which opportunities are transformed into value-creating economic activities. In these cases, the technologies may prove fruitful in reducing the context uncertainty (Chalmers *et al.*, 2021). On the one hand, new technologies represent a source of uncertainty (McMullen and Shepherd, 2006); however, on the other hand, they can spur the entrepreneur to capture new opportunities before the incumbent companies (Obschonka and Audretsch, 2020; Townsend *et al.*, 2018).

These technological advancements are changing the entrepreneurial scenario. It is essential for ventures to nurture a digital transformation culture oriented toward fostering continuous transformation. New technologies and their developments are creating many new opportunities for entrepreneurs to increase their capability to manage new business models and improve their companies' performances, leverage and competitiveness (Fossen and Sorgner, 2021). Further, digital capabilities, when combined with other competences (e.g. new translation services that leverage the language competences of external contractors with AI to provide a better and faster service to their clients such as the case of the firm "Translated" that has been able to create a service for 194 languages in 40 specialization areas used by other companies such as Google.inc, IBM and organizations like the European Union and the World health Organization), can be decisive factors in guiding acceptance by entrepreneurs.

It is relevant to examine the factors that aid entrepreneurs in embracing new technologies and using them creatively and openly as the basis of their ventures. We suggest that the dynamics of entrepreneurial ventures are highly influenced by new technologies, and it is crucial to understand their evolution in the context of digital transformation. Hence, it is critical to explore entrepreneurs' daily evolutions and activities to shed light on the effects of adopting these new technologies.

As a result of this editorial, we expect to provide readers with additional knowledge related to new technologies in the domain of entrepreneurship and increase understanding of their key role for the future of entrepreneurial ventures. Entrepreneurs may exploit new opportunities from new technologies and increase value for their ventures and primary stakeholders leveraging their competences in the search for a competitive advantage.

This editorial represents an initial contribution to what promises to be an important and fruitful phenomenon in the study of new ventures and their development, and we suggest that new technologies play a key role in entrepreneurship. These technologies influence entrepreneurial behaviors and significantly affect the entrepreneurial decision-making process. Further, we suggest that a wide variety of new technologies may affect entrepreneurial opportunities differently. Moreover, it is important to understand the evolution of new technologies, the factors that guide the entrepreneurial process and the effects of new technologies on the management of entrepreneurial ventures.

Articles in the SI

In addition to the current editorial, the special issue comprises ten papers focused on several types of new technologies and their relationships with entrepreneurship.

The first paper, titled “Theorizing artificial intelligence acceptance and digital entrepreneurship model” written by [Upadhyay et al. \(2021\)](#), examines the entrepreneur’s intention to accept AI and provide advancement in the domain of digital entrepreneurship. The study reveals several antecedents of entrepreneur’s intention to accept AI for digital entrepreneurship, and in this sense, is the first research in this field. Specifically, the results show the factors affecting the intention of entrepreneurs with respect to accept a new technology, such as AI, for digital entrepreneurship and in particular that performance expectancy, openness, social influence, hedonic motivations and generativity positively influence the entrepreneur’s acceptance intention of AI; similarly, uncertainty has a positive impact on the AI acceptance intention, while inconvenience has a significant negative effect on the intention to accept AI; interestingly, affordance has no direct relationship with AI acceptance intention, but it influences AI acceptance intention through attitude. This paper provides also novel insights on the relationship between AI and digital entrepreneurship, and proposes a new and interesting theoretical model, namely AIADE (AI acceptance and digital entrepreneurship), whose hypotheses are tested and validated through partial least squares structural equation modeling (PLS-SEM). This model is one of the first in this field and represents a potential point of reference for many scholars who may leverage it for future studies and apply it in other contexts or types of technologies.

The second paper, “The digital transformation of entrepreneurial work” by [Corvello et al. \(2021\)](#), focuses on the impact of digital transformation on the work of owners in entrepreneurial firms. The study examines the interplay between working practices and technology taking into account the organizations’ specific contexts. The study highlights through a multiple-case study design based on eight cases of entrepreneurial firms (defined as companies that bring new products and services to the market by creating and seizing opportunities) that the digital transformation of entrepreneurial work is an evolutionary, practice-based phenomenon, rather than the result of rational design. The use of different digital tools is interrelated and depends on the characteristics, and dynamics of the surrounding environment. The research is the first to consider the interplay between digital technology and the daily activities of entrepreneurs, considered as a whole, thus providing insights on how these interconnected dimensions evolve, and contributing to understanding the work of entrepreneurs, and as a consequence the dynamics of entrepreneurial firms in the context of digital transformation of organizations.

The third study entitled “Entrepreneurial dynamics in two-sided platforms: the influence of sides in the case of Friendz”, written by [Trabucchi and Buganza \(2021\)](#), sheds some new light on the intersection between platforms and entrepreneurship by exploring the power that sides have over the platform provider in shaping the platform’s entrepreneurial evolution. Over the years, entrepreneurship scholars mainly focused on the platform’s ability to enable entrepreneurial ventures for the complementors’ side, exploring the network-centric view, while this research expands it by investigating the broader influence that sides can have on the platform provider’s entrepreneurial decisions over time, during the evolution of the two-sided platform. By exploring the creation and the evolution of a specific two-sided platform, in a longitudinal single-case study developed over five years, the study proposes a double network view on two-sided platforms and highlights three network-related tensions that can guide the evolution of the two-sided platforms.

The fourth study, “Equity crowdfunding platforms and social media: a Twitter analysis” by [Battisti et al. \(2021\)](#), focuses on a specific type of platforms, namely equity crowdfunding platforms. Today a growing number of entrepreneurs use these platforms to raise funds for their entrepreneurial firms, however, there is little knowledge on the role played by social networks in producing and disseminating information about equity crowdfunding. The study employs a social network analysis technique to examine and understand the users’ network that is created on Twitter when it comes to crowdfunding. Particularly, the findings show that a large number

of users tweeted about equity crowdfunding in relation to the introduction of the specific regulations and the operators of the sector (in particular crowdfunding platforms), are central to the network, followed by traditional and specialized media.

The fifth study, titled “New media marketing as a driver of enterprise country of origin (COO) offer in international markets” written by [Vrontis and Basile \(2021\)](#), focuses on the role of Web 2.0 and social media in international marketing, shedding new lights on the relationships existing between the country of origin effect – seen as an idiosyncratic entrepreneurial offer – and consumer behavior. This study highlights the increasing role of Web 2.0 and social media as tools enabling enterprises to create and maintain adaptive and networking capabilities and to implement international marketing strategies. The research shows that international marketing is becoming increasingly similar to domestic marketing because of social media development and social media – particularly during the pandemic era – can improve and enhance relationships between the product of origin and consumer behavior both in the assessment and in the actual purchase of products.

The sixth study, “Exploring entrepreneurs business related social media typologies: a latent class analysis approach”, by [McLaughlin et al. \(2022\)](#), presents typologies of entrepreneurs using their engagement and use of social media for business purposes as a means of categorization. The research employs a two-phase quantitative opportunistic sampling approach – based on structured interviews with entrepreneurial experts and an online survey, based on the theory of planned behavior, with entrepreneurs at business incubation centers in Ireland – and latent class analysis to identify a number of entrepreneur typologies using participants business-related social media activities. The study shows that there are four distinct types of entrepreneurs based on their business-related social media activities: Based on this categorization, four types of entrepreneurs are proposed: the Hopefuls, the Assureds, the Opportunists and the Passengers.

The seventh study, titled “The transformative leadership compass: six competencies for digital transformation entrepreneurship” by [Schiuma et al. \(2021\)](#), proposes a novel framework, composed by six specific competencies, as a model to outline the critical competencies distinguishing a digital transformative leader capable of driving continuous company innovation and specifically digital transformation entrepreneurship. The framework is particularly helpful to understand what affects the organizational culture and behaviors driving digital transformation. The study underlines the need for nurturing a transformative digital leadership allowing enterprises to stay competitive and able to change and adapt to the scenario’s evolution, and – at the same time – it profiles the digital transformative leader, i.e. a key figure in companies competing in the digital age to nurture digital transformation entrepreneurship. This research is particularly topical as in the current digital age, companies require leaders to foster digital transformation entrepreneurship, i.e. the organizational attitude and orientation of the creation of a new business or the development of an existing business by having at the core or embracing digital transformation as the continuous development and application of digital knowledge for companies’ value creation.

The eighth study, titled “The behavior of managers handling digital business transformations: theoretical issues and preliminary evidence from firms in the manufacturing industry” written by [Matricano et al. \(2021\)](#), explores the behavior that managers assume when they approach digital business transformations (DBTs) by focusing on whether they act as mentors/facilitators or entrepreneurs/innovators, as coordinators or decision-makers. The research analyzes ten case studies about manufacturing firms and show that managers need to modify the organizational culture of their firms to handle a successful DBT. However, firms can assume different organizational cultures and thus the role assumed by managers handling a DBT can change as well.

The ninth study, “Cut me some slack! An exploration of slack resources and technology mediated human capital investments in entrepreneurship” written by [Jabbari et al. \(2022\)](#),

investigates the relationship that slack resources and technology-mediated human capital investments can have on individuals' entrepreneurial intentions. Focusing on human capital investments that individuals make through education and work, the study explores the relationship among formal online learning opportunities, informal skill development in the gig economy and entrepreneurial intentions. Through a survey of over 8,528 low- and moderate income (LMI) households, the research uses machine learning and propensity score weighting to examine the likelihood that individuals who make these technology-mediated human capital investments will have increased odds of entrepreneurial intentions when compared to similar individuals who do not make these investments. The results highlight that both partaking in online learning and working in the gig economy are significantly associated with increased odds of entrepreneurial intentions. Furthermore, technology-mediation reveals as an important factor in these relationships and that informal skill development and career preparation is one way in which gig employment influences entrepreneurial intentions.

The tenth and last study, "Entrepreneurial approach for open innovation: opening new opportunities, mapping knowledge and highlighting gaps" by [Flamini et al. \(2021\)](#), provides an accurate map of the knowledge evolution of the open innovation (OI)-entrepreneurship relationship and interesting gaps to be filled in the future. The research sheds some lights on the mechanisms by which an entrepreneurial approach may benefit OI processes and vice versa. By using a bibliometric analysis (with a systematic literature review), this study shows five thematic clusters: entrepreneurial opportunities, organizational opportunities, strategic partnership opportunities, institutional opportunities and digital opportunities for OI. Finally, a framework for future avenues for further developing the topic is provided.

Concluding discussion and remarks, and avenues for future research

In this editorial, we attempt to contribute to the current literature by proposing a new framework through which to explore the intersection of new technologies and entrepreneurship by highlighting the importance of developing new digital technology capabilities and embracing digital transformation to better navigate uncertain environments.

Accepting new technologies may help entrepreneurs effectively utilize them to obtain more valuable capabilities to further improve their knowledge set. This, in turn, will create reduced uncertainty and lead to entrepreneurial actions ([Obschonka and Audretsch, 2020](#); [Townsend et al., 2018](#)) and the creation of new ventures (based on these new technologies or facilitated by their adoption), while enhancing the entrepreneurial orientation of firms and increasing their chances of playing an active role in developing new technology-related innovations.

We hope that this research provides trajectories for future study in this domain. Analyzing the relationship between new technologies and entrepreneurship uncovers the need for further research in several areas. The rapid spread of new technologies and the emergence of a new class of digital-based entrepreneurs open a wide range of areas to explore, as the current literature primarily focuses on the use of these technologies to provide benefits for entrepreneurial ventures. We believe that future research should focus on the role of new technologies in enabling new venture creation and the importance of increasing entrepreneurs' use of them, which will, consequently, reduce context uncertainty. Below we propose relevant topics for such future research.

First, a paucity of studies explores the antecedents of entrepreneurs' intentions to use new technologies as well as how and to what extent they will mitigate the underlying perceived uncertainty. Second, the increased need for companies to embrace digital transformation leads them to nurture a digital culture which is crucial to the development of digital technologies capabilities; the latter aspect deserves particular attention paid both at the

individual (i.e. the entrepreneur) and company level (i.e. the new venture created). Third, it would be worthwhile to examine the differences between individual types of technologies compare the entrepreneurs that use them widely and proactively with those who remain reluctant; this type of research, also extended to the company level, may provide interesting results related to technology benefit and performance. Additionally, further study of new technology-related innovation is needed; the role of digital platforms and social media has become increasingly relevant for various purposes – including internationalization, networking and resource mobilization – and policymakers and other primary stakeholders should pay attention to its development to support and stimulate a proactive adoption.

Moreover, it would be interesting to analyze how the constructs in the conceptual model interact with the entrepreneurial orientation and how companies interact with these new technological contexts. Finally, many existing studies, such as those cited in this paper, are conceptual or qualitative in their approaches, and thus there is a need for further quantitative research to provide empirical evidence of the phenomenon. The study by [Upadhyay et al. \(2021\)](#) attempted to move in this direction by exploring entrepreneurs' intentions to use AI.

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