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ADVANCES IN GLOBAL SERVICES AND RETAIL MANAGEMENT

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# AI as a Boost for Startups Companies: Evidence From Italy

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## Abstract

Innovative startups are growing everywhere; clearly, digital transformation is imperative for all businesses to compete, or better survive. Institutions prompt companies and businesses to adopt digital transformation tools, providing funds too, especially to startups (MISE, 2019). In particular, this study analyzes Artificial Intelligence, understanding its implications, ties and features in startups. No commonly agreed definitions are given about AI and startups, thus the tie between them should be deepened. One of the most cited definitions considers startup as a temporary organization looking for scalable business models (Blank, 2013). In literature little attention has been paid to the connection between startup and AI. The flurry of interest in AI is triggering a variety of reactions, as the capacities to favour startups (Agrawal et al., 2017), making them more scalable (Rinzwana, 2019). Ten case studies were selected in a qualitative research, due to the early stage this field of study is in and to adopt a wider perspective. From a practical perspective, this research shows the potentialities of AI in changing markets, business activities, and ways of serving customers. This research describes how AI can trigger novelties through startups creation and the engine of novelties in markets.

**Keywords:** artificial intelligence, startups, innovation, entrepreneurship

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## Introduction

“It is not the strongest of the species that survive, nor the most intelligent, but the one more responsive to change.” This quote from Charles Darwin, the father of evolution (Darwin C. 1859). Not by chance technological and innovative startups have shown a good ability to adapt to crisis and difficulties brought about by the global pandemic: one in three has changed their business model, half has obtained new customers, 44% has accelerated product development. Collaboration between companies, startups and Open Innovation is growing (Gauthier, 2020). Thanks to new technologies, traditional business paradigms are experiencing a strong change: new organizational roles are emerging, the need for a new entrepreneurial culture is growing, the related ecosystem for innovation is changing with new players like startups and tools like Artificial Intelligence (AI). As an important feature, digital maturity is required. It is fundamental for a company to successfully carry out digital transformation and AI, as a science (Russell and Norvig, 2003) able to produce complex systems, can significantly improve startup companies’ performances. New technologies, startup Companies, and AI may go hand in hand: digital disruptors and innovative startups are changing traditional business exploiting existing practices, products, services, and contents using, above all artificial intelligence, and all kinds of new technologies.

According to a 2019 research by the British venture capital MMC Venture, the dynamics of AI entrepreneurship in Europe are growing and the landscape for startup entrepreneurs has changed. This effort typically leads to liabilities of newness that have to be overcome by aspiring entrepreneurs wanting to create enduring organizations (Hallen, Bingham, & Cohen, 2014). Artificial intelligence startups reached record investments of \$ 26.6 billion worldwide in 2019. The figure is up from \$ 22.1 billion in 2018 and \$ 16.8 billion in 2017 (Cbinsights, 2019). In 2019 Europe's 1600 AI startups have matured, bringing creative destruction to new industries, and navigating new opportunities and challenges. This is a key figure, since in 2013 just 1 out of 50 new startups embraced AI, while in 2019, 1 in 12 put AI at the heart of their value proposition, so the percentage of European medium and large companies employing artificial intelligence technologies has gone from 2% to 8,25%. The group is led by the United Kingdom, with almost 479 startups that take advantage of AI technologies, more than double of France, which follows with 217 companies, and Germany, third at 196. In eighth position there is Italy, with 66 highly technological startups (MMC Ventures, 2019). As of 2019, 10,630 innovative startups in Italy have increased employment by 6% per half year, with over 40,000 shareholders. 700 million € capital raised in fundraising and over 10,000 employees have been reached; at the end of September 2019, an astonishing 2,576 innovative startups started thanks to a digital and free establishment method, with an increase of 169 units compared to the figure recorded at the previous registration, at the end of June 2019 (Sole24Ore, 2019).

2021 for Italian Innovative startups may be a year of growth, though the uncertainty brought by pandemic somewhat hinder this prediction. The National Fund for Innovation (Fondo Nazionale Innovazione - FNI) became operative, therefore, the Government may be able to invest through venture capital operations, in strategic companies and startups, thus giving the great opportunity to generate new investments, a better way to align the interests of Italian investors and entrepreneurs towards the common goal of economic growth (MiSe, 2019).

Today, the literature on startups and Artificial Intelligence is rather sparse, there is still little scientific evidence on the subject, but the conditions are promising rather than simply positive. The scalability of startups (Bailetti, 2012) may achieve even higher levels via novel technologies (Rinzwana, 2019), but further clarifications are needed on how this effect may occur. Thus, this paper proposes a review on startups and artificial intelligence aiming at setting the ground for research based on highlighting the tie between these two topics. The analysis of startups from the Italian context allows the depiction of some insights and outlooks on how artificial intelligence can favour the emerging and the workability of new ventures. The description of Italian startups' case studies and an analysis on the role of artificial intelligence lead to some consideration for both scholars and practitioners, while the paper ends with limitations and the identifying of avenues for potential further research.

## **Literature Review**

### ***Startups***

In the last decade startup companies are increasingly growing. During the past years, scholars have underestimated the importance of the birth of new innovative companies considering them an integral part or at most a particular dimension within the general study on entrepreneurship

(Matricano, 2019). Hence, in literature several contributions analyzed the phenomenon of startups and tried to define what a startup company is.

Startups play a key role in innovation processes (Colombo & Piva 2008; Davila et al., 2003). According to the well-known definition by Steve Blank (Blank, 2013), a startup is a company, a partnership or a temporary organization designed to search for a repeatable and scalable business model. The term "temporary" and the term "search" should be highlighted, because the future of a startup is to stop being a startup to become part of a big business or to fail and move on to another opportunity. In fact, the difference between a startup and a small business is that this latter is not capable of this type of rapid scale and probably does not even go towards this goal.

The term "scalable business model" in this case means a business that can increase its size (therefore its customers and its turnover) exponentially, without using proportional resources. Digital Transformation with new inventions, new software and algorithms is essential for supporting this kind of growth (Paternoster, 2014). Many scholars in literature have tried to question the link between the advent of new technologies and the development of startup companies (e.g., Rickman, 2012; Neri, 2015). Seeking the major studies on the phenomenon of startups, the importance of technology to support the new business models of today's startups immediately emerges.

Recently, scholars highlighted different drivers of success from new technologies and financial instruments to systems to support startup growth through institutions like seed accelerators and their supportive instruments (Greco et al., 2018). In this domain, technology is miraculous because it allows us to "do more with less" (Thiel, 2017, p.8). Bailetti (2012) highlights six elements that a startup needs to achieve in order to scale globally and quickly. These six elements are: i) Scope of the problem, ii) Commitments of interested parties, iii) Collaborative entrepreneurship, iv) Relational capital, v) Legitimacy and vi) Global capacity. These six basic steps can help a technology-based startup to operate globally from the early stages.

In any case, startups are not just based on technologies; indeed, according to Ries a startup is a "human institution designed to deliver a new product or service under conditions of extreme uncertainty" (Ries, 2011 p.27). Hence, there seems to be clear that the emphasis is placed on the term "human institution". More precisely, starting from this definition it is possible to identify the startup with what it does, referring to its products or services, forgetting that part of its value is in its organizational culture, which is a core element of all great former startups. The point of reference for the emergency conditions is that the true startup does not copy, does not make a script, but does something really new and then compares with conditions of uncertainty, because it goes where nobody has ever before (Greco & Capobianco, 2017). Complex processes, demanding influential customers, or the liability of fixed capital and human costs are far from the logic of startups. Due to startups' proximity to sources of technological knowledge, they are capable of experimenting with different approaches, enabling them to respond with agility to shifting needs (World Economic Forum, 2015).

During last years much attention has been paid to studying the causes and factors that determine the birth of startups (Sorrentino, 2003) but also and above all the "post-entry" trend of startups, i.e., the results achieved or achievable by new companies that use and exploit innovation and technologies (Decker et al., 2016). In Italy, scholars and practitioners increasingly consider the

phenomenon of startup companies as a solution to the several problems of economic decline and unemployment (Matricano, 2019). This optimistic view meant that the policy makers considered it necessary to initiate numerous support measures within the "Decreto crescita 2.0" of 2012. Within the latter, the government's attempt to support startups is evident through tools to create economic wealth.

### *Artificial Intelligence*

Digital transformation affects businesses in multiple ways, as scholars stressed with reference to business models (Haaker et al., 2021), everyday practices (Ivancic et al., 2019), and strategies (Ismail et al., 2017) among others. Digital transformation embeds several tools, as mobile computing, 3D printing and Artificial Intelligence (Nambisan et al., 2017).

The definition of Artificial Intelligence is still debated, as practitioners consider it “the simulation of human intelligence processes by machines, especially computer systems. These processes include learning [...], reasoning [...] and self-correction” (Rouse, 2019), while scholars framed it as “the study of complex information processing problems that often have their roots in some aspect of biological information processing” (Marr, 1977) or simply as “the intelligence exhibited by machines or software” (Pannu, 2015). Business scholars refer to Artificial Intelligence as a means to perform activities and to favour learning (Duan et al., 2019). Anyway, Artificial Intelligence became a research topic already in 1950, but only recently it attracted great attention, also because of the improvements in computing power. The debate is two-fold, as there are concerns about “putting the power of AI into the wrong people’s hands, and general concern and caution when it comes to new technology” (Schmelzer, 2019), but the advantages may be observed also in business activities, as AI may affect how “firms take decisions and interact with their external stakeholders (e.g., employees, customers)” (Haenlein, 2019). Therefore, scholars are paying attention to what AI can do for businesses, due to the nature of the challenges and opportunities it offers; indeed, AI-based systems may do thinking and routinary tasks, while human employees may focus more on the ‘feeling side’ of the business (Huang et al., 2019). This should lead to an improvement of the extant ways outcomes are achieved by firms, but also new opportunities may emerge, instead of incremental improvements (Magistretti et al., 2019). AI may affect managerial practices to support companies in the discovery of new paths for development and integration.

The current debate shows AI as a general-purpose technology with new opportunities yet to come, since the efficiency of the decision-making process grows exponentially (Van Knippenberg et al., 2015). The implementation of AI is thought as the next source of competitive advantage (Huang et al., 2019) and a lever to stimulate new investments and favour entrepreneurial orientation (Baldegger et al., 2020). This can be a reason for major attention to startups in using this technology and for researchers to investigate AI in startups. Due to this, further research is needed to better understand the contribution of Artificial intelligence in reshaping services and their provision by performing various tasks, constituting a major source of innovation (Rust and Huang, 2014). These authors in 2018 also developed a theory for understanding the nature of service work and how/why AI can substitute for or ultimately replace humans in each type of task/job. The gap identified in describing the concrete contribution of AI to services is also mentioned by Bock et al. (2020), due to its disruptive effects yet to be fully understood.



### ***Startups and Artificial Intelligence: First Theorizations***

In literature very little attention has been paid to the study of the connection between startup companies and artificial intelligence. Scientific evidence regarding the integration of AI and startups are still quite limited. However, there are several positive and promising contributions, such as the case studies analyzed, which increase the thesis according to which Artificial Intelligence is a key, useful and successful engine for an innovative startup company but, as we may see, our Italian professional and educational context must be improved.

History shows us that the main technology companies such as Apple, Google and Amazon that are highlighting artificial intelligence today at the time of their birth were startups. Since the launch of the first products on the market, these already showed a predisposition for future uses of artificial intelligence systems. For instance, the use of data analytics and algorithms is another critical application of artificial intelligence (Bornet et al., 2020). These algorithms predicting the products that specific clients may buy next can be used to optimize cross-selling and up-selling. For example, Netflix achieved impressive results from the algorithm it uses to personalize recommendations to its 100 million subscribers worldwide. Netflix estimated these customized search results saved it \$1 billion in annual revenues that would otherwise be lost to canceled subscriptions (McKinsey, 2017).

The flurry of interest in AI is triggering a variety of reactions, everything from excitement about how the capacities may quickly increase the startup businesses (Agrawal et al., 2017) making startups more and more scale ups (Rinzwana, 2019). Moreover, the risk that artificial intelligence can become a simple formula for acquiring more funding is real. According to David Kelnar (2020), head of research at Mmc Ventures, startups that use the definition “AI” receive on average 15 to 50% more funding than those that are simply only technology based.

Regarding the Italian startup ecosystem, the risk in AI is two-dimensional, a double scenario opens. From a commercial point of view, the Italian markets may not yet be mature. Instead, from a technological point of view, the risk of failure in scientific research is one of the biggest business challenges faced by European and, in particular, Italian startupper. So, according to the Global Consulting Roland Berger, AI startups should be seen as business labs, basing their experiments on fresh algorithmic research – “a model that is not easily captured by traditional due diligence scanning” (Roland Berger GmbH, 2018). Consequently, the focus should not be on an immediate ROI and on research and development results. Indeed, it should be imperative to set higher incentives in terms of risk and return, with a consequent improvement in the possibility of acquiring startups, making exits more profitable.

Compared with the USA context and other European countries, one of the main reasons why Italy is at the bottom of the ranking about AI implementation is the absence of integrated training able to provide industries, professionals, and young people with tools necessary to better embrace the jobs of the closest future. Along similar lines, according to Bessen et al. (2018), the commercial AI applications offered by startups today are more about enhancing human capabilities than they are about replacing humans. The Italian education system and the traditional world of work do not encourage the culture of risk-taking, seen as a resource for sharing with greater force and experimentation. To realize an AI ecosystem over time, it is necessary to encourage Italian successful startups and successful companies to invest in new technologies through corporate risk

capital by creating and celebrating success stories that we focus on our talents; even foreign digital entrepreneurs could find in Italy the ideal place where innovation and a sense of beauty can be combined everywhere (Marinoni, 2019). In this way, Italy may be able to attract fundings and to consolidate, over time, a vocation for the business of the future focused on the birth and growth of successful startups which implement Artificial Intelligence. All should be accompanied by a renewal of the Italian education system and a reimagination of business: in order to get the most value from AI, operations need to be redesigned. To do this, startups must first discover and describe an operational area that can be improved. In conclusion, according to Harvard Business Review, startupperes should do new and different things and do things differently (Davenport et al., 2019).

## Methods

The novelty of the topic and the gaps identified in literature favoured the highlighting of a promising but still limitedly explored relation between artificial intelligence and startups; indeed, the challenges and opportunities brought by Artificial Intelligence may stimulate the setting of startups as well as their further development; apart from the aforementioned call by Bock et al. (2019), also Neubert and van der Krogt (2018) had stressed the need to study the societal impact of Artificial Intelligence, with particular reference to entrepreneurship and new ventures. This focus on a micro-level is also mirrored in Rippa and Secundo (2019), as they stated that Artificial Intelligence inspires new business and startups greatly mirrors the impact on new business creation.

To get some more insights on the infusion of Artificial Intelligence in startups, some case studies were chosen to depict the concrete contribution of Artificial Intelligence in new ventures and to answer to the following questions:

- Do startups emerge through artificial intelligence-based solutions? How does this happen?
- Are Artificial Intelligence-centred solutions being implemented in startups?

Ten case studies from multiple industries shape our qualitative research process; this choice depends on the early stage this field of study is in and to adopt a wide perspective on the conditions of startups implementing Artificial Intelligence and its tools. Flick et al. (2004) suggested the use of qualitative methods in dealing with emerging topics. Our research process aims at grasping meaning from multiple case studies via an inductive approach applied - as suggested by Marschan-Piekkari & Welch, 2011) to look for general explanations.

Similarly, our data collection is inspired by Nieto and Pérez (2000), as they proposed using multiple sources and cases when the boundaries of a phenomenon and its context of observation are not particularly evident. Data sampling was based on a ranking provided by Crunchbase, an online platform providing information on startups on their way to get a key position in their business context, including the stock market. Crunchbase dataset was queried to list the top 10 funded startups in Italy until 2019. Therefore, the 10 case studies we chose are Italian startups, since this gave us a privileged position to collect data from multiple sources also to achieve triangulation as a way to enforce the reliability and the interpretation of results (Flick et al., 2004); indeed, we made use of official websites, local media, additional websites, and other minor sources. The case studies selected from the local context gave us the opportunity to interpret the

implementation of AI; the case studies chosen are: Musixmatch, Cynny, Cogisen, Travel Appeal, Thron, ELSE Corp, MDOTM, Roialty, Ayxon AI, and Kellify. Their belonging to different industries and their variety in terms of age lead to a good balance between homogeneity and heterogeneity in the research context, thus further reducing the bias in case studies analysis.

## Findings

The analysis of the ten case studies, led us to classify them in three groups based on the addressees of the activity and the main effect they currently offer. In the following table we summarized the key information on the 10 startups we analyzed, leading to a categorization we based our findings on.

**Table 1.** Key Information on Case Studies

Startup name	Industry/Business	Funded achieved	Main activity	Category
Musixmatch	Leisure - music	16.8 mln \$	Natural language processing	Tools
Cynny	Digital communication	14.0 mln \$	Machine vision	Data analysis for marketing
Cogisen	Digital communication	8.1 mln \$	Video compression	Tools
Travel appeal	Tourism	8.0 mln \$	Travel	Data analysis for market
Thron	Digital communication	7.0 mln \$	Marketing	Data analysis for marketing
ELSE Corp	Design and marketing solution	2.7 mln \$	Fashion tech	Data analysis for marketing
MDOTM	Finance	2.3 mln \$	Fintech	Data analysis for market
Roialty	Digital marketing	2.2 mln \$	Marketing	Data analysis for marketing
Ayxon AI	Finance	1.8 mln \$	Fintech	Data analysis for market
Kellify	Finance	1.7 mln \$	Fintech	Tools

Due to this, the three groups are ‘Data analysis for market’, ‘Data analysis for marketing’, and ‘Tools’. All the cases shaping the first two groups are offering B2B services, while the group ‘Tools’ hosts either B2C or B2B solutions.

### *Data Analysis for Market*

This group embeds Travel Appeal, MDOTM, and Ayxon AI. These case studies all offer the use of data to analyse a key feature in a market through the opportunities brought by artificial intelligence. Travel Appeal collects data from over 500 sources in order to create the potentially biggest database in the tourism industry. The analysis of this data leads to the creation of various algorithms and as a consequence to information offered through graphics, maps, and trends. The main aim of the expected information is to combine trends and predict prices, number of tourists visiting a place, expected revenues for hospitality firms. Due to this offering, the firm claims the opportunity to increase firms’ revenue up to 25%, increase employment, and favour a higher number of direct bookings up to 7%, supporting more conspicuous margins for firms. Currently, almost 3.000 firms subscribed for this service and some of them implemented even a chatbot in order to shape new tourism offerings to be proposed to tourists.

MDOTM is a startup using Artificial Intelligence algorithms to create investment strategies for the financial market. As in the previous case data collection and analysis are two key processes, since they allow the creation of trends and the relationship among them and with other impacting variables, as rumours. The main aim is to counteract market inefficiencies and create useful tools

for the banking and insurance industry to offer less risky and more performing financial products to investors.

Ayxon AI is the third case in this group; it deals with the same industry than MDOTM; indeed, financial data are analysed even with a different goal, since artificial intelligence is used to analyse the solvency of loans offered to firms and merchant banks. The need of using artificial intelligence depends on the wide amount of data to be considered, since these loans are complex in nature and based on multiple goals. Long-term predictions, analyses of performance, and trends analysis are some of the key actions proposed by Axyon. Additionally, the solution proposed by Axyon can be used to support decision-making in investments.

### ***Data Analysis for Marketing***

This group consists of Cynny, Thron, ELSE Corp, and Roialty. This group features firms proposing the use of artificial intelligence in the marketing relationships a firm has with customers, thus changing the way a marketing action is performed.

Cinny set a platform based on Artificial Intelligence and allows the recognition of gender, age, and emotions of users. The platform offers a software named MorphCast that can analyze facial expressions and adapt marketing tools to users' emotions, gender, age, and potentially other features in future. The software is run onto a remote server and can be embedded in other marketing tools already in use from a firm. Additionally, the rate of correct recognition of emotions and gender is over 95%. Cinny already dealt with problems related to privacy and data management, since data protection is ensured by software features and by the usage of big data.

Thron is a software-as-a-Service, it offers a way to classify digital contents in order to propose the most suitable ones to users, based on what is considered as aligned to their personal features. The platform combines performance management tools, with asset evaluation and service provision, in order to be integrated with all operations, but mainly with marketing as a solution for e-commerce, CRM, and online communication. Thron customizes communication through Artificial Intelligence that profiles people based on the content they have consulted. Several world-famous brands chose this service and they already confirmed costs reduction as one of the key benefits.

ELSE Corp is somewhat similar to Thron, but it embeds even distribution channels management. Design customization, orders management, and new solutions to favour online shopping are the core of the offering; these services are based on customers' features and they should allow firms in the fashion industry to make offers more suitable to consumers. The insights from sales are further analysed through artificial intelligence in order to update the information to be used for manufacturing; indeed, cloud production as well as 3D manufacturing are additional services firms can implement.

The fourth case pertaining to this group is Roialty; this firm offers a solution for digital marketing, since data from social networks are analysed and based on online interactions and personal data firms would get insights on how to address messages and products to consumers. In order to increase customers' engagement there is a chance to gamify the online interaction; this leads to collecting additional information. Moreover, the analyses are not limited to consumers, but they are even oriented to analyse competitors, since reputational analysis, benchmarks, and other social

listening activities are performed to compare firms. Finally, the firm offers support to learn how to use the services proposed.

### ***Tools***

The case studies shaping this group are Musixmatch, Cogisen, and Kellify. This last group consists of firms implementing artificial intelligence to shape new tools to be used in specific industries. New services or enriched ones may emerge from the infusion of these tools in business activities.

Musixmatch collects, shares, and analyses lyrics from songs all over the world. The aim of the firm is to build the widest dataset of lyrics in the world. The services are addressed to end-users as well as to other firms working through machine learning; in the first case, users can look for song lyrics, while firms using this service can create recommendations, further analyse lyrics looking for feelings, reactions, and paths among songs.

Cogisen has developed an innovative eye tracking software that allows the recognition of the position of the eyes and the gaze direction of a person. It offers a platform to be implemented in different ways, but the most common use is related to video sharing platforms, since an algorithm can compress videos and favour a quicker sharing and an easier storage of videos compared to the available technologies. The implementation of artificial intelligence creates the content considered as other than core, while only the core part is really stored. The same algorithm can be applied to streaming too and further ways to use it are expected in relation with IT safety and autonomous cars driving.

The last case of this group is Kellify, a firm creating algorithms to correlate daily events and value of commodities. Price transparency and inefficiency reduction are the key goals of this firm, since some commodities can be considered as useless or be perceived of minimal value, while for art lovers and collectionists they can have a very high economic value. Automated learning, cognitive processes, and data combination and analysis are the pillars of this system offering information on value to all users.

### **Discussion and Implications**

The case studies we analysed helped us in grasping some more meanings about what artificial intelligence can offer to startups and - even before - to new ideas development; specifically, artificial intelligence can be thought as a supportive element to favour new approaches to the markets, to launch new products, new services, new ways of doing, thus it greatly catalyzes innovation in businesses.

This first consideration is aligned and expands the study on the tie between entrepreneurship and innovation (Matricano, 2019), bridging these two topics with the adoption of artificial intelligence. Indeed, it represents an innovation driver for firms in order to change how markets are shaped (Nenonen and Storbacka, 2018), but also how operations are performed and services are offered. The evidence of this study recalls the contributions by Rust and Huang (2014), stressing how artificial intelligence may change service orientation in firms and services themselves, but it also highlights manufacturing, service design, and service provision as three processes are mainly affected by artificial intelligence. This feature of artificial intelligence is mirrored in the three groups proposed in this study, as it may change the approach to market, marketing, and services

via new tools. A focus on the infusion of artificial intelligence expands the previous understanding (Garbuoi, 2019) of industries and firm typologies affected by technological innovation spurred by recent developments of artificial intelligence.

Additionally, this study not only confirms how AI supports existing businesses (Kai-Uwe Brock, 2019), but also shed light on how new ventures and ideas can be feasible realized through artificial intelligence. Thus, this represents an answer to call for research by Magistretti et al. (2019) wondering how managerial practices may be affected by the essence of new technologies as artificial intelligence. Indeed, artificial intelligence impacts the approach firms have to the market, both in general and via marketing activities; moreover, innovation proved to be not only a feature of artificial intelligence itself, but also a path a firm can follow to access markets and launch new propositions.

Finally, scholars considerations on scalability of business models (Thiel, 2017) may be broadened when considering artificial intelligence, because the essence of some AI-based processes depends on a wide scale of data and processes, leading to examine scalability as an innate feature of new ventures deploying new processes, services, and products through artificial intelligence. This evidence complements the consideration on the disruptive effect (Bock et al., 2020) of Artificial Intelligence on products, services, and the startups themselves. Artificial intelligence appears to express its performative impact by stimulating new ventures and innovation.

From a practical perspective, this research shows some of the potentialities of artificial intelligence in shaping markets, business activities, and ways of performing service actions for customers. Thus, the positive impacts new technologies had on the Italian context should encourage interventions at both a micro- and a macro-level. Indeed, at a micro-level, new investments in startups can be partnered by artificial intelligence as a carrier of new opportunities to be infused in new companies and creating the chance to innovate markets and firms' processes. At a macro-level, national and supranational institutions should encourage changes through artificial intelligence since the beneficial impacts on innovation, employment, and competitiveness are self-evident.

All in all, artificial intelligence mirrored the opportunity to chase for two key features of startups: rapidity and scalability, since the diffusion of innovation through artificial intelligence-driven processes is faster and can easily operate on a wider scale, as often large amounts of data are required and a variety of application - both in B2B and B2C markets - are achievable.

### **Conclusions, Limitations, and Further Research**

To sum up, this research describes how artificial intelligence can act as the trigger and the engine of change in markets through startups creation. The features of artificial intelligence are aligned with what new ventures need, namely with the chance to catalyze innovation processes, to offer something completely new, or to reshape existing services and processes in a more performing way.

The nature of this study is exploratory, thus some limitations are self-evident. Firstly, the startups considered are among the most successful in Italy, but a wider sample may lead to more detailed and relevant considerations. Additionally, the analysis is based on multiple sources and conducted

as a desk analysis, thus the implementation of other methodologies may lead to new insights. Indeed, we believe further research on these topics can expand the evidence achieved in this paper by considering a wider amount of Italian startups and the focus can be expanded to other countries too, in order to understand if the readiness of entrepreneurs is related to the context. Moreover, the analysis of startups can be partnered by interviews in order to confirm the findings already achieved and to get new insights on these new ventures, also through the analysis of their performance as soon as available. Next research may address a comparison of startups in the same sector, giving emphasis to those who are using AI and those who are not adopting it, in order to catch the difference in terms of economic performance, customer perceptions and quality of business model. Finally, the overview on artificial intelligence as a driver of innovation and success for startups may be enriched by considering the evaluation of users and their customer experience, satisfaction and loyalty, both in the B2B and in the B2C market. This would require future research efforts also in a long-time span.

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