

FUTURE RESEARCH DIRECTIONS IN DIGITAL TECHNOLOGY BASED ENTREPRENEURIAL ECOSYSTEM

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ABSTRACT

The radical advancement in digital technologies and artificial intelligence has transformed innovation and entrepreneurship activities in significant manner. In recent times the world has adopted various policies to promote the development and adoption of innovative artificial intelligence and grow their entrepreneurial ecosystem. Entrepreneurship is the process of construction of novice ideas by investing time and effort and intellectual, financial, and social risks to earn financial gains, job satisfaction, and independence. In this paper, we review the literature on how artificial intelligence embraces the birth and development of a new entrepreneur ecosystem. This paper also outlines the various research opportunities in entrepreneurship by acknowledging the role of artificial intelligence in it.

Keywords: Digital technology, Artificial Intelligence, Entrepreneurship, Entrepreneurial ecosystems

1. Introduction

The fast growth of digital technologies, for example, information technology, mobile services, cloud computing, big data, and artificial intelligence, has changed the business environment, promoting digital entrepreneurship. In turn, this has infused new life into traditional industries, allowing them to survive and adapt to the modern world. For traditional and new enterprises [7] [15], it has become an important issue to

build an entrepreneurial ecosystem that will facilitate the evolution of digital technologies. Spigel and Harrison [18] described an entrepreneurial ecosystem as an organic social unit in which multiple independent subjects and their environments participate to foster entrepreneurial activities. To promote new products and services, members of the entrepreneurial ecosystem share knowledge bases, technologies, and skills and work in a healthy competition that makes a complete ecosystem. Entrepreneurs act as the main leaders, and various activities in such an ecosystem behave like products. There is a great bonding between the entrepreneurial ecosystem and digital technologies as entrepreneurship is attached to our cultural, social, and economic activities. To meet the requirements of nascent markets, technology companies customize their services to encourage startups as their entrepreneurial partners.

To build successful business models and a lively entrepreneurial ecosystem, digital technology has become a significant tool. Entrepreneurial ventures include digital platforms [16], internet-based web services, digital art [17], digital products, and many more. With the help of digital media like Amazon and Flipkart, these activities enhance the reachability of online businesses to simple customers and stakeholders, communicating several customers' requirements with social media like Facebook, Whatsapp, etc. Technology innovates various new ventures and new entrepreneurs who make use of digital platforms and their inherent capabilities to set up their start-ups.

Big companies have enabled new startups to sharpen their specialization and help in other facilities like production, marketing, selling, and purchasing. These arrangements have also enabled their ecosystem by enforcing technological standards by expanding their system development life cycle [19].

This paper progresses as follows: initiating from a literature review to describe how digital transformation and entrepreneurial ecosystems communicate with each other, this paper also discusses an agenda for future research.

2. Literature Review

Entrepreneurial ecosystems have been in practice for many years. Silicon Valley is a famous example of an entrepreneurial ecosystem [20] that

manages the circulation of financial funds, digital technology, and entrepreneurial projects within its internal capacity. The development of digital technology has led to the fast growth of digital entrepreneurs, digital firms, and the ecosystems that reside around the world.

Entrepreneurial ecosystems are active not only in the microprocessor and computer fields, but also in medical, electronic appliances, automobiles, and smart gadgets. There is a great demand for digital technologies in various digital entrepreneurial ecosystems, which produces a large basket of opportunities for entrepreneurs to offer. For example, in recent times, the sports industry has begun integrating various forms of digital capabilities into existing games —capabilities that offer transmission services, replay analysis, semantic video analysis, etc.—fundamentally altering players' experience with games.

In recent years, the data-driven decision-making industry has generated many entrepreneurial opportunities by inducing innovation and technology. For example, Babelnet provides machine translation in a multilingual setup. Technology giant companies are also developing and maintaining their entrepreneurial ecosystems. In the next section, there is a review of various research publications in the last ten years based on digital technology in the entrepreneurial ecosystem.

Authors in [1] have described the use of industry 4.0 technologies such as artificial intelligence, blockchain, IoT, cyber-physical systems, big data, etc., which have accelerated the momentum of digital technology evolution and globalization of businesses.

Cennamo et al. [2] mentioned the effect of the propagation of digital technologies on entrepreneurship as a holistic redefining and innovation governance process. This pervades the beginning of the digital era and technology-prone marketplaces.

In [3], the authors discussed the implications of artificial intelligence-based entrepreneurship for emerging ventures in the Industry 4.0 era. The formation of a new venture, as well as the integration of artificial intelligence and other digital technologies, will affect entrepreneurs collectively rather than individually, and thus will affect entrepreneurs on a broader trajectory.

In 2020, Bjorkdahl showed that various industries are still away from taking advantage of digital transformation and are mainly emphasizing attaining higher efficiency through technology transformation rather than chasing an extension agenda. [4]

The author in [5] discussed the need for integration of technology development, adoption, implementation, and appropriation to achieve smart city planning with efficiency.

There have been a lot of startups in the digital technology-enabled IT hardware sector and also enabled stage-dependent propositions regarding their hardware sector effects. Authors in [6] have used an exploration type of digital technologies within entrepreneurial ecosystems.

This paper [7] shows the potential of collaboration and collective intelligence to design and develop reliable and sustainable entrepreneurial startups by leveraging the digital technology paradigm.

There is a detailed study of how the influence of technology on entrepreneurial marketing decisions is affected during the COVID-19 times [8]. Here the authors have collected data from 127 SMEs in Bangladesh and analyzed the data using the quantitative method. Their study reveals significant relationships between entrepreneurial opportunity identification and development and opportunity exploitation in the context of entrepreneurial marketing decisions.

The authors of [9] have sparked new research on the sociotechnical phenomenon of digital innovation. Digital innovation is a rapidly expanding field of study that examines the pervasive processes of digital technology development and their socio-technical implications.

Authors in [10] studied the M-machine concept for the incorporation of artificial intelligence technology in the context of entrepreneurial education. They defined fuzzy models of fuzzy regulators by introducing the neural network in enterprise training.

This article [11] uses a scientific computing system to perform research on a digital problem-solving tool, which is in high demand in the fields of engineering and technology. With such an advancement in high-performance computing technology, several parallel computers have emerged and are hence responsible for analyzing scientific computing

requests.

The authors in [12] realized the digital innovation and entrepreneurial ecosystem. This article focused on the development of an innovation and entrepreneurship education platform. They used deep learning algorithms to realize this motive. The advantages of deep algorithms in strong image processing and quick access to big data lead to the development of digital innovation and entrepreneurial ecosystems. Their research indicated that 49.5% of college students and 35.2% of undergraduates showed an interest in digital entrepreneurship.

Further, in [13], the authors described how to realize the capabilities of higher education institutes for higher sustainability, these organizations are adopting digital technology (MOOCs). In this article, the authors highlighted the impact of MOOCs' adoption on universities' intrapreneurial capabilities.

The authors in [14] showed their results that organizations should adopt to facilitate the elementary components with the different levels of entrepreneurial orientation, size, and age of the companies. Experiments confirmed that concerning the individual components of strategic learning, the relationship between entrepreneurial orientation and strategic learning is non-linear and complex.

3. FUTURE RESEARCH DIRECTIONS

This paper sheds some light on the role of digital technology in the entrepreneurial ecosystem and the impact of digital transformation during the adoption of digital technology to take advantage of the technology-based economy.

Digital technologies are the self-organizing activities of creating entrepreneurial ecosystems. Hence, reducing the mediator roles in digitally-enabled chains and delivering their new services promptly. Digital technology-enabled ecosystems provide knowledge sharing and cooperation.

3.1 The role of digital technology in promoting the entrepreneurial ecosystem:

However, currently, there is a shortage of research studies that adopt system perspectives because of the rise of technological complexities involved;

there is a continuous change in various components of the ecosystem. By applying this system perspective future research can complement ours by outlining the affecting factors for the creation and commute in entrepreneurial ecosystems.

Focusing on digital technologies as promoters raises important research questions, such as what role actors, such as makerspaces, play in supplementing access to and educating entrepreneurs about how to use digital technologies [21], whether and how digital technologies can improve the traditional advantages inherited from spatial ecosystems such as Zhongguancun and Silicon Valley, and how the embracing momentum of digital technologies differentiates.

3.2. Digital technology as a consequence of entrepreneurial pursuits:

The second research focuses on entrepreneurial projects that create digital technologies as the central component of their ventures' market offerings [6]. Just like digital technologies as promoters of entrepreneurship, digital technologies that create the center of market offerings have the potential to reshape and conquer enterprise creation processes and consequences. This digital technology-based entrepreneurship provides great opportunities for entrepreneurs to offer new ideas. For example, a large number of startups offer digitized hardware such as smart home appliances, drones, daily activity trackers, and robots, while other start-ups commercialize digital infrastructures such as online repositories and digital tools. Industry 4.0 will revolutionize artificial intelligence, blockchain, virtual reality, digital platforms, etc.

3.3. Digital technologies in the broader context of entrepreneurial ventures:

The third research direction focuses on the use of digital technologies in larger contexts of entrepreneurial ecosystems such as healthcare, automobiles, or financial organizations to enable entrepreneurship [6]. For example, Google Auto and Apple CarPlay like digital platforms facilitate augmented ecosystems for the software industry and provide traditional organizations such as the automobile industry with access to an entrepreneurial ecosystem from the outside. Digital technologies can fill the gaps in the availability of huge amounts of data that has to be processed and analyzed in the health industry and financial industry to challenge the

existing conditions. Other industry sectors such as biotechnology create vast amounts of data that need to be stored, processed, and analyzed [22], thereby creating opportunities for digital ventures to fill gaps in and improve the overall process. For example, genome sequencing has led to a large amount of data based on which new market ventures get exploited.

3.4. Digital technology as a holistic perspective :

The fourth research direction sheds light on the holistic approach of digital technology to emerging industry ventures. Various crowdfunding platforms like IndieGoGo and Kickstarter are the digital ventures' outcomes and facilitate the broader context across several industry domains. As a result, it is also necessary for researchers to take a holistic and multidisciplinary approach to find answers on how to collaborate with digital technology-based emerging enterprises that are market offerings and provide multi-level theorizing.

3.5. Interdisciplinary entrepreneurship and digital technology:

Digital entrepreneurship is a phenomenon that facilitates a fertile field for new research ideas that have digital technologies as their central element. An illustrative example of this direction is based on the article [15]. The study showed the infusion of early internet ventures by using social capital theory from sociology provides success in the enterprise model view from strategic learning and digital technology-based entrepreneurship as the context.

It is highly beneficial to work in a team with other team members from the entrepreneurship domain to unite theoretical views and disperse outcomes in the management and entrepreneurship domains [6] [7].

3.6. Digital technology in systematically designed studies for enterprise ventures:

Earlier research has emphasized personal observations and case studies to find the various strategies enterprises use in the digital entrepreneurial ecosystem. Such a perspective reflects the growing nature and the lack of data in research. To understand and validate the strategic plan for a new enterprise venture to be used in a digital technology-based entrepreneurial ecosystem, more systematic studies are required. Succeed in the long run, researchers have to identify shifts in their strategic plans over time, and longitudinal research can help them achieve under those conditions.

4. CONCLUSION

The inception of new and dynamic digital technologies, digital infrastructures, and digital platforms has transformed entrepreneurship in a significant manner. The main objective of this article was to articulate the prospective for future research directions in the digital technology-enabled entrepreneurial ecosystem. This paper highlights the various perspectives for future research in order to adopt a holistic approach to consider the implications of digitization for entrepreneurship from multiple domain perspectives. The paper also identifies the importance of digital technology in developing and structuring entrepreneurial ecosystems.

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