



Impact of Technological Innovation on Digital Entrepreneurship and the Effects on The Economy

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Abstract

Digital technologies are transforming the entrepreneurial landscape and enabling the democratization of entrepreneurship. The ongoing advancement of digital technologies has transformed the business environment and created a wide range of opportunities that have led to new ways to pursue entrepreneurship. This paper highlights the different definitions of digital entrepreneurship proposed by various scholars and discusses the impact of digital technologies on academic entrepreneurship, entrepreneurship as a field of practice, and entrepreneurship research. The paper introduces three accepted manuscripts and shows how they contribute to filling the gaps in knowledge in the field. Furthermore, the paper proposes a research agenda focusing on the impact of digital technologies on the field of entrepreneurship. The review highlights the need for future research to investigate the effects of digital technologies on the entrepreneurial phenomenon and to explore how the digital economy might affect our conceptualization of entrepreneurship in its nature and shifting contours.

Keywords: Digital entrepreneurship, Technological innovation, Economic growth, Economic

Introduction

Today's new technology revolves around digitalization, encompassing phenomena like artificial intelligence (AI), the Internet of Things (IOT), big data, blockchain, and digital transformation. The advent of these technologies is profoundly restructuring innovation ecosystems, changing traditional governance and management models, and the process of competitiveness and economic growth (Beliaeva et al., 2019; Tomizawa et al., 2020). Recently, the rise of digital technology-based entrepreneurial firms has prompted extensive research to understand the nature and consequences of digital entrepreneurship and innovation. As technology continues to transform industries, economies, and societies at an unprecedented pace, understanding and harnessing the power of these interconnected domains becomes increasingly vital.

Economic development has long been a focus of economic strategies, but it is only in the last few decades that sustainability has risen to the center of economic discourse and acquired substantial significance. Environmental conservation and social inclusion have made inroads into modern economics in recent times. Economic development cannot be sustained without social

equality and environmental sustainability; it has become more obvious. Environmental sustainability is the route to the world we desire for everybody, stated former UN Secretary-General Ban Ki-moon. It provides a framework for achieving economic development, social fairness, environmental responsibility, and improved governance. Economic, social, and environmental sustainability all fall under the umbrella of sustainable development. Due to resource restrictions, conflicts between social, economic, and/or sustainable environmental objectives sometimes in between develops. However, according to modified neoclassical growth theories, in order to provide economic stability for future generations, it is critical to accomplish sustainability. Current policies, increased employment, and technological dissemination are all critical for sustainability performance. Entrepreneurship is characterized by a willingness to take risks, a strong sense of initiative and creativity, and a passion for developing new ideas and opportunities.

Entrepreneurship has become an increasingly important aspect of the global economy in recent years, as advances in technology and communication have made it easier for individuals to start and manage their own businesses. Today, entrepreneurship is recognized as a key driver of economic growth and innovation, and many governments and organizations around the world have implemented policies and programs to support and encourage entrepreneurship. Technology has had a significant impact on entrepreneurship, transforming the way entrepreneurs start, run, and grow their businesses. Here are some of the key ways in which technology has impacted entrepreneurship:

1. Lowered Barriers to Entry: Technology has made it easier and cheaper to start a business, with tools such as cloud computing, e-commerce platforms, and social media enabling entrepreneurs to reach customers and scale their businesses faster than ever before.
2. Increased Access to Information: The internet has made it easier for entrepreneurs to access information, research markets, and connect with potential customers, suppliers, and partners from anywhere in the world.
3. Enhanced Efficiency and Productivity: Technology has enabled entrepreneurs to automate routine tasks, streamline operations, and increase efficiency and productivity, freeing up time and resources to focus on innovation and growth.
4. Disrupted Traditional Business Models: Technology has disrupted traditional business models, creating new opportunities for startups and challenging established players in industries such as transportation, retail, and media.
5. Improved Customer Experience: Technology has transformed the way entrepreneurs interact with their customers, with tools such as social media, mobile apps, and chatbots enabling businesses to provide personalized and seamless experiences across multiple channels.

Overall, technology has played a crucial role in driving entrepreneurship and innovation, and is likely to continue to do so in the years to come.

Methods and Materials

Existing research focuses mainly on how digital technology is changing traditional entrepreneurship. Digital technology entrepreneurship is insufficiently studied even at the qualitative, descriptive level, its role in social and economic development is not disclosed. Therefore, the purpose of this article is to determine the importance of digital technology entrepreneurship in regional development on the basis of clarification of its key content characteristics. Digitization has been the dominant aspect of China's economic progress over the last ten years. Various sectors in China have undergone a revolutionary shift due to the Internet. Thus, there is a significant need for digital transformation at both the industrial and enterprise levels

(Li et al. 2017). Enterprises anticipate that digital transformation will stimulate disruptive innovation, foster the emergence of novel business forms and models, and enhance the quality, efficiency, and degree of resource allocation within the industry (Wan et al. 2015). Digital transformation is a way in which to use digital technology and capabilities to drive the reconstruction of an organization's business model and business ecosystem. Digital transformation has two cores: technology and organizational change. From a technological perspective, digital transformation is the application of information technology in a company's production process (Goerzig and Bauernhansl 2018), the process of driving change and innovation in the way in which a company operates its production services (Zhang et al. 2022), and the utilization of digital technologies and devices for major operational improvements (Fitzgerald et al. 2014).

From an organizational change perspective, digital transformation focuses on changes in organizational processes and business models (Loonam et al. 2018) to improve business performance by changing the path of corporate value creation through digital technologies (Vial 2019; Ribeiro 2021). Overall, digital transformation is a way in which to handle and use digital techniques, technologies, and capabilities to drive organizational model innovation and ecosystem reconfiguration to achieve business transformation, innovation, and growth (Coskun-Setirek and Tanrikulu 2021; Akter et al. 2022). <https://doi.org/10.1057/s41599-023-02378-3> and value creation changes," the "use of digital technologies," "dynamic capabilities," "strategic responses," and "consumer behavior" (Kraus et al. 2022). As enterprises' digital transformation level continues to increase, their contribution to technological innovation becomes more assertive (Nambisan et al. 2017; Guo et al. 2022). Since (Christenson 1997) introduced the concept of disruptive innovation, academics have been divided on its definition. Disruptive innovation involves "doing things differently," aiming to exploit new products and technologies through radical changes to existing products and technologies. This form of innovation is a crucial strategic tool for companies (Adner 2002), whether it be in terms of technological innovation (Danneels 2004), business model innovation (Paap and Katz 2004), or a combination of the two (Schumpeter 1934). In general, disruptive innovation creates high-performance products that replace original mainstream market products. This innovation is achieved through the utilization of new technologies or the integration and application of existing technologies from different disciplines and fields. Once successful, disruptive innovation can not only enable enterprises to dominate in terms of market share and obtain enormous profits but also foster the development of the whole industry (Laursen and Salter 2006; Foss and Saebi 2017; Dahlander et al. 2021).

However, disruptive innovation requires a large number of significant risks and a high degree of tolerance for uncertainty, often also requiring rich knowledge accumulation, outstanding research and development (R&D) capabilities, and continuous large-scale capital investment (Forés and Camisón 2016). Due to the shortage of R&D funds, knowledge reserves, and excessive potential risks, many enterprises adopt the "focusing on quantity" innovation strategy. These enterprises are unwilling to innovate or challenged in terms of innovating radically (Wenjing and Manni 2016; Cao 2020). Digital transformation plays an important facilitating role in the achievement of disruptive innovation. Relying on the inherent superiorities in cross-time and cross-space communication, data processing, and information accessibility (Wu et al. 2021), digital transformation helps enterprises integrate and reconstruct the innovation process of internal and external resources, processes, and structures. Moreover, digital transformation can effectively

alleviate financing difficulties (Lee et al. 2023) and innovation risks (Jafari-Sadeghi et al. 2021) and increase the level of R&D cooperation (Lee et al. 2021; Rocha et al. 2021; Soluk and Kammerlander 2021).

Results

At the first stage of the study, the definition of digital technology entrepreneurship is clarified by synthesizing recognized scientific ideas about the essence of technology entrepreneurship and the digital economy. As you know, classical technology entrepreneurship is a project for the commercialization of new scientific and technical knowledge, usually on the basis of technology firms (startups). What is important for understanding digital technology entrepreneurship is that it does not necessarily involve the use of fundamentally new scientific knowledge and technologies. Digital technology entrepreneurship can use well-known commercial technologies to solve various consumer problems, work with software products, in the Internet space. A typical example of digital technology entrepreneurship is the development of new software products, applications for smartphones, technical solutions for automation of production, control of technology processes (for example, the use of GPS navigation technologies to control road transport). However, excessive expansion of the scope of the concept is also incorrect. Already, many traditional entrepreneurs, who are not directly related to digital technologies, use these elements in their activities. Almost any small business can store information in the cloud, manufacturing firms can become more efficient using the Internet of things, etc. Thus, almost all entrepreneurial firms can use digital technologies, but this does not give grounds to classify them as digital technology entrepreneurship. According to the authors, in order to separate digital technology entrepreneurship from other types, it is advisable to use the criterion of the source of consumer value creation. Digital technology firms offer the consumer goods, works, services, where consumer value is created primarily by digital technologies. The consumer receives mainly the end result of the operation of digital technologies (information, analysis data, automation services, ready-made solutions). If an entrepreneur uses digital technologies in their activities, but the consumer value is not directly based on them, it is a traditional entrepreneurship that uses digital technology as a consumer. In particular, a company that provides GPS-monitoring services for vehicles or Internet of things technology for semiautonomous driving, monitoring the condition of vehicles is an example of digital technology entrepreneurship, since the result of the consumer's interest is formed by the direct use of digital technologies. At the same time, it can use both its own and purchased from another vendor programs, devices, computer networks.

On the contrary, a car service or transport service provider can use digital technologies in its work, e.g., cloud technologies or block chain, but it is not a digital entrepreneurial firm, because the value for the client in this case is created without the direct application of these technologies. Thus, digital technology entrepreneurship is proposed to be understood as entrepreneurial activity in the course of which all or most of the consumer values are created by the direct use of digital technologies. This definition makes it possible to clearly define the range of digital technology entrepreneurs for research and management decision-making. Next, let's consider the problem of classifying digital technology entrepreneurs. According to the authors, taking into account modern ideas about digital technologies, it is important to categorize them according to the following classification grounds: availability of technologies of own development; sphere of activity of the

digital technology entrepreneur; origin of the entrepreneurial project, degree of its independence; content of the digital technologies used.

Discussions

The results of the study show that digital technology entrepreneurship has a certain specificity, a rather complex structure that requires a specific approach to its support. The promotion of digital entrepreneurship has a multi-directional positive impact on the social and economic development of the region. Therefore, for the accelerated development of digital technology entrepreneurship at the sub-federal level, the following recommendations are proposed according to the results of the study. To achieve a synergistic effect, integrate measures for the development of entrepreneurship in the part of digital technology entrepreneurship with activities for the implementation of the National program "Digital Economy of the Russian Federation". To differentiate measures of the state support of digital technology entrepreneurship (taking into account its specifics) in programs and projects of development of small and medium-sized enterprises of federal and regional levels, taking into account more significant economic effect and influence of this type of entrepreneurship on digitalization of economy. Within the framework of stimulation and support of innovative ecosystems of technology entrepreneurship on the basis of universities, innovation clusters, development corporations to allocate separate blocks of activities, resources and results on digital technology entrepreneurship. Create institutions and forms of collective use of digital resources for startups and existing technology entrepreneurs, the cost of creating or accessing which is generally not available to single technology firms. When implementing projects and programs at the regional level to modernize existing enterprises, increase productivity, introduce digital technologies in basic economic activities, maximize the potential of local digital technology entrepreneurship, integrate it into the value chains of large companies. At the same time, access to traditional incentives and support institutions is also important for the development of digital technology entrepreneurship: preferential financing, innovation infrastructure, training and acceleration programs.

Conclusion

Since 2017, the term "digital technology entrepreneurship" has appeared in scientific circulation, reflecting the significant role of entrepreneurship in the digitalization of the economy. However, its essence, types, features, and impact on social and economic development remain uncertain. The study found that digital technology entrepreneurship offers a consumer value as a result of the use of digital technologies (both developed by the technology firm itself and purchased from other suppliers). This defines the main features and potential of digital technology entrepreneurship. This type of entrepreneurship occupies an intermediate place between traditional and technology entrepreneurship. In turn, digital technology entrepreneurship is heterogeneous and differentiated according to the criteria of the sphere of activity, the degree of independence; the content of the technologies used. The contribution of this type of business to social and economic development is not limited to the quantitative growth of output or gross regional product. It increases the efficiency of branches of specialization, as well as creates conditions for the active development of the "soft" component of the regional innovation ecosystem (social capital, innovation culture, practices and competencies for innovation).

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