

CHALLENGES AND OPPORTUNITIES FOR DIGITAL INNOVATIVE HUBS DEVELOPMENT IN EUROPE

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Abstract

Digitalization serves as a catalyst for game-changing innovations in European rural business. Thereby, the study of digital innovative hubs is relevant. The current research problem lays upon the understanding of main challenges and opportunities in order to foster digital innovative hubs development in rural areas. The investigation methodology is based on the digital innovation concept explaining their role in achieving rural business benefits. Firstly, the paper aims to provide scientific review of digitalization impact on rural business development. Secondly, the aim is to examine the challenges for rural business digitization. The findings of this study have a number of practical implications, concerning opportunities for providing support of digital innovative hubs in Europe, increasing the potential of competitive business development in rural area.

Keywords: digital hub, rural business, innovation, Agri hub, investment, funding, European program.

JEL Codes: G17, O13, O32, R00, R51.

Introduction

Rural development is recognized as one of the major priorities of the European Union Common Agricultural Policy. In particular, experts discuss transformation from analogue to smart farming and food production (digital agriculture) by 2030, ensuring that all men and women, including the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance (UN DESA, 2019). The way of farming and food production is changing due to digital technologies and innovative business models implementation in Europe. In particular, the

key to meet the grand challenges facing European agriculture nowadays concerns digital technologies, enabling to transform a great measure of farm operations into data-driven, intelligent, agile and autonomous ones (Ecosystem..., 2019). The fourth industrial revolution increases use of information and communication technology (ICT) in agriculture (Floreano and Wood, 2015). There is an urgent need to improve a situation in rural areas to support European farming and food industry global competitiveness through autonomous, robotic vehicles that have been developed for farming purposes, such as mechanical weeding, application of fertilizer, or harvesting of fruits. Thereby, the actual issue is to support the development of digital

hubs in rural areas, which aim to exchange digital experience and good practices between project partners operating in business, research and science, and regional authorities.

Thus, scientists and practitioners are highly motivated to consider digital innovative hubs as an important platform for streamlining production processes, products, and services by implementing digital technologies in Europe.

Literature review

Several previous studies have found that the digital economy widespread has a pivotal role in overcoming a measure of important economic and social challenges associated with rural areas development (Philip and Williams, 2019). ICT is fast becoming a key instrument in bringing about rural business transformation (Deshmane, 2016). In accordance with EU2020 strategy, there is a need for innovative and ICT development in rural areas to achieve “sustainable rural intensification”. Digital technologies and their implementation by EU farmers are considered as main drivers in maintaining European agriculture competitive globally (Agricultural..., 2019). ICTs are considered as powerful platforms for business expansion, concerning impact on the productivity and rural business effectiveness (Aleke et al., 2011). In particular, the SmartAgriHub experts define digital innovative hubs as a broad value-chain network across all EU member states, employing a multi-stakeholder approach. The practical researches aim to investigate the consortium of digital innovative hubs that includes a diverse network of start-ups, SMEs, business and service providers, technology experts and end-users (SmartAgriHub, 2020). Philip and Williams (2019) pay attention to both a measure of challenges and opportunities that digitalization offers for home-based businesses in rural areas. Malecki (2003) concerned the lack of access to data infrastructure and service provision in rural areas as compared to urban areas in the context of rural business digitalization and “digital divide” researches. There are also

some researches, concerning digital innovative hubs development in particular European countries, namely these researches, provided by Crupi et al. (2020), Åkerman et al. (2018), Queiroz et al. (2020), Ferrero et al. (2018).

However, in light of recent global tendencies of social and economic development, it is important to highlight the challenges and opportunities for digital innovative hubs development in European market.

This paper has the following key aims. Firstly, the central thesis of this paper is the challenges for digital innovative hubs development in Europe. Then, it aims to assess the opportunities for digitalization widespread in rural areas and its impact on rural businesses development. Finally, the research issue will be addressed to digital innovative hubs formation and further development. This study set out to test both theoretical and applied background of the hypothesis that rural business focuses both challenges and opportunities due to digital boost. *The purpose of this study* is to provide scientific support on building the digital innovative hubs in Europe. The *object* of the research is rural business. The *subject* is digitalization influence on its development, concerning digital innovative hubs formation and the potential of providing flexible support to overcome the digital divide in order to improve the business environment in rural areas.

Methodological assumptions

The *methodological approach* taken in this study is a mixed methodology based on researches and reports, concerning rural business development and understanding the impact of digitalization on rural society. In particular, this study employed survey methodology to investigate the impact of information and communications technology (ICT) on rural business. This paper uses data from scientific articles from the last ten years to study challenges and opportunities for digital innovative hubs development in Europe. Both qualitative and quantitative

methods were used in this investigation. A case-study approach was used in research to manage the possibility of its practical implication within national and regional Industry 4.0 plans and strategies to accept rural business challenges in Europe.

The current research consists of the following parts: primarily, a theoretical framework based on digital innovative hubs definition and their role for rural business development; secondly, the main challenges faced by many digitalized businesses in rural areas; then, this study provides an exciting opportunity to advance digital innovative hubs development in Europe; finally, the potential for European digital innovative hubs development is examined. In particular, the study develops the digital innovation concept, highlighting the role of digital innovation in achieving rural business benefits. The theoretical background of the study is provided through the representation of alternative approaches to definition of digital innovative hubs, addressing the issue of understanding the reason how the European digital innovation hubs are filling the role of business drivers in the rural area. The applied part of research recognizes the role played by digital technologies to create new business processes in rural area, supporting digital innovative hubs development in Europe. The sources of data for the analysis were several databases, including the European Commission (European Commission, 2017), Eurostat (Eurostat..., 2017) and the World Bank data (Agriculture..., 2018). A combination of quantitative and qualitative approaches is used to analyse the challenges and opportunities for digital innovative hubs development in Europe.

Main theoretical assumptions of the research

To better understand *the relationship between digital innovations and rural business development*, the present study comprises a systematic review with specific focus on digital innovation essence and its functionality. Digital innovation is used to ensure the application of digital technology to existing business problems.

Some studies have attempted to define digital innovation quite broadly as a product, process or business model that is perceived as new, requires some significant changes on the part of adopters, and is embodied in or enabled by IT (Yoo et al., 2010; Benbasat and Zmud, 2003; Fichman et al., 2014).

Currently, digital technology is considered as increasingly important in achieving business goals, and its pervasive effects have resulted in the radical restructuring of entire industries (Nylén and Holmström, 2015). Papa et al. (2018) considered the experience of Italian firms operating in different sectors and applying digital technologies, positively moderating the relationship between knowledge acquisition and innovation performance. In order to identify digital innovation essence, Usai et al. (2018) combined entrepreneurial knowledge with innovation process generated by technological advancement in knowledge-intensive sectors.

To date, rural businesses face the need of transformation, innovative development and new technologies adoption in order to stay competitive. Recent evidence suggests that farmers work more precisely, efficiently and sustainably due to the potential of digital technologies. In particular, data-driven insights are able improve decision-making of agricultural business, providing opportunities to revolutionize agriculture, to assist rural business in part of increasing environmental

performance and making the job more attractive to younger generations. Existing practical experience recognizes the critical role played by digital technologies in rural areas development in Europe. Recently, digital potential of rural areas is an important topic of the Horizon 2020 work program within the Rural Renaissance call. Innovation and digital technology are priorities of the Smart Specialization Platform for Agri-Food (European agricultural..., 2019; EIP-AGRI, 2019). Due to the European network for rural

development (ENRD) forecast, EURO 24 bn from European funds will be spent on digital innovative hub development that makes nearly 16% of RD expenditures in 2020 (Rural development..., 2019).

Taken together, digital technologies provide the opportunities to modernize business models in value chains by conducting digital innovative initiatives to make rural businesses more attractive (Figure 1).

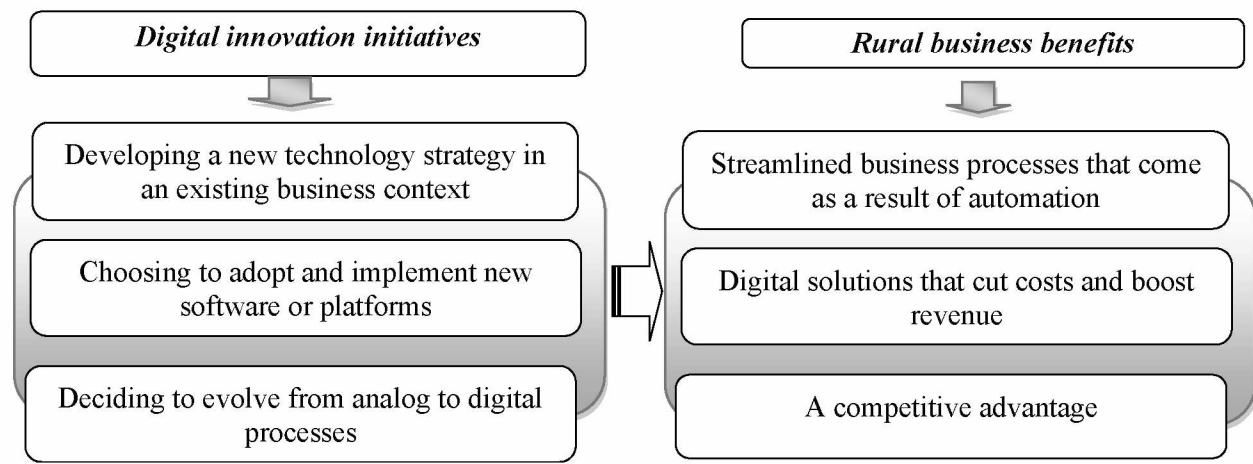


Figure 1. Digital innovation and their role in achieving rural business benefits

Thereby, digital innovation is considered as one of the best solutions for rural businesses that wish to evolve and stay its competitiveness.

The subject of *digital innovative hubs as a driver for rural area development* is a

dominant feature of a great measure of modern researches. Thereby, four different approaches are used to explore the digital innovative hubs functions (Table 1) (Crupi et al, 2020).

Table 1. Alternative approaches to definition of digital innovative hubs

Approach	Digital innovative hub definition	Scientists and experts, who support the approach
<i>1</i>	<i>2</i>	<i>3</i>
Knowledge transfer	In addition to being intermediaries (rural business and technology developers), digital innovative hubs are capable of generating knowledge themselves based on their inner characteristics. Digital innovative hubs are aimed to increase their digitalization level, identifying current gaps.	Haas, A. (2015), <i>Crowding at the frontier: boundary spanners, gatekeepers and knowledge brokers</i> , edited by Claude Paraponaris, Dr Martine Siga, P ^{re} , <i>Journal of Knowledge Management</i> , Vol. 19 (5): 1029-1047.; Harada, T. (2003), <i>Three steps in knowledge communication: the emergence of knowledge transformers</i> , <i>Research Policy</i> , Vol. 32 (10): 1737-1751.

Openness increase	Digital innovative hubs become not only a space in which to share knowledge but also a trigger to help SMEs reach higher levels of openness, which, in turn, encourages the exchange of knowledge between firms	Creswell, J.W. and Poth, C.N. (2016), <i>Qualitative Inquiry and Research Design: Choosing among Five Approaches</i> , Sage publications.
Business relationships	Digital innovative hubs are not only facilitators in the creation of relationships but also are active players in the definition of connections and selection of the best partner for SMEs	Abbate, T. and Coppolino, R. (2011), Knowledge creation through knowledge brokers: some anecdotal evidence, <i>Journal of Management Control</i> , Vol. 22 (3): 359-371.
Externalities	Digital innovative hubs act as external enabling factors that foster connections with other companies and institutions mediating the interaction between unconnected actors.	Quinton, S., Canhoto, A., Molinillo, S., Pera, R. and Budhathoki, T. (2018), Conceptualising a digital orientation: antecedents of supporting SME performance in the digital economy, <i>Journal of Strategic Marketing</i> , Vol. 26 (5): 427-439

Thus, digital innovative hubs are used for rural business to remain competitive internationally. Rural areas should be able to reap the benefits of digital transformation, building digital innovative hubs in Europe. The rural digital innovative hub represents the whole spectrum of rural business activity, including agrarian and food industries, commerce, researches and IT development. This model facilitates innovation platforms for multi-stakeholder development projects and start-ups within digital health. It creates synergies with international research and innovation networks and builds up new partnerships to highlight trends and gaps in

policies in the arena of rural business development (Digital..., 2012).

Results of the research and discussion

Rural businesses play a significant role in the European economy development, particularly because of the potential to employ about 30% of European population, who live in a rural area (Eurostat..., 2017). In relation to European Commission and European Investment Bank analysis of economic indicators, more than 40 % of rural businesses have an annual turnover of more than EUR 100 000. However, nearly 40% of these businesses had a turnover below EUR 25 000 (Figure 2).

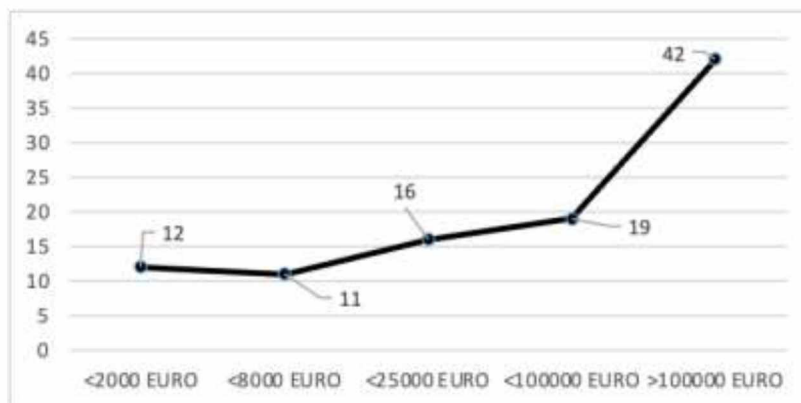


Figure 2. Annual turnover of rural business, % (Survey..., 2019)

At the same time, only about a half of rural businesses access to online technologies that decrease their productivity and make almost impossible acting within digital innovative hubs. The same percentage of rural business representatives (about 50 %) are

considering initiatives related to digital innovation as rural hub function (CORA..., 2019). A measure of difficulties experienced by digital innovative business in rural area are caused by *challenges for rural business development*, including these mentioned in Figure 3.

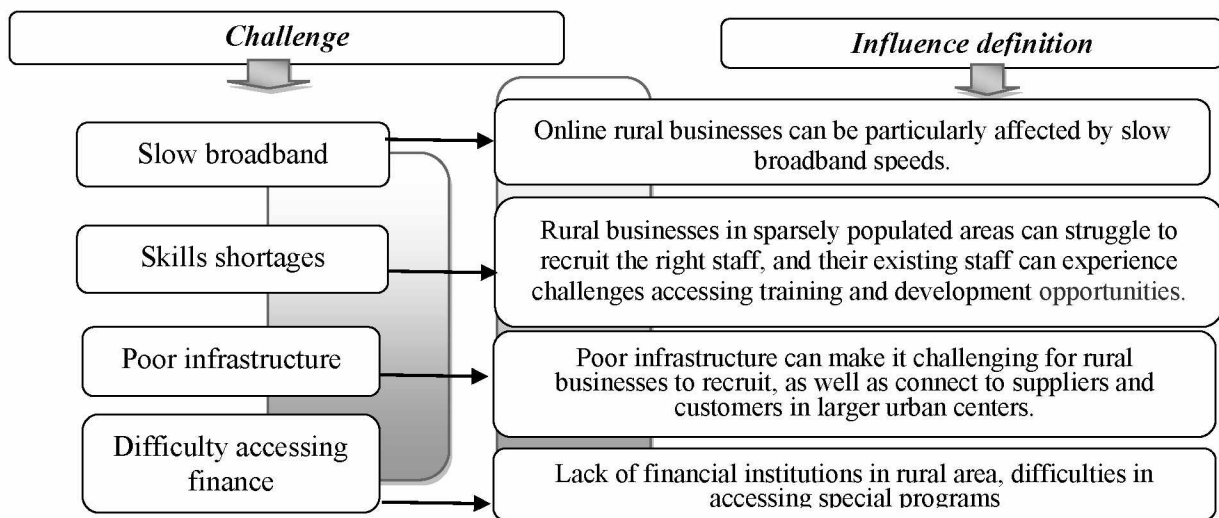


Figure 3. Digital innovative business challenges in rural area

Thus, digital innovative hub development in the rural area highly depends on having access to high skilled labour, good infrastructure links and accessing finance. Additionally, broadband speed is important as the basis for rural business digitalization.

In order to address the above-mentioned challenges, EU countries are implementing rural development programs to promote digital changes within innovative rural hubs. These programs contribute to the cross-cutting objectives of innovation, creating environment for digital innovative hubs development (Figure 4).

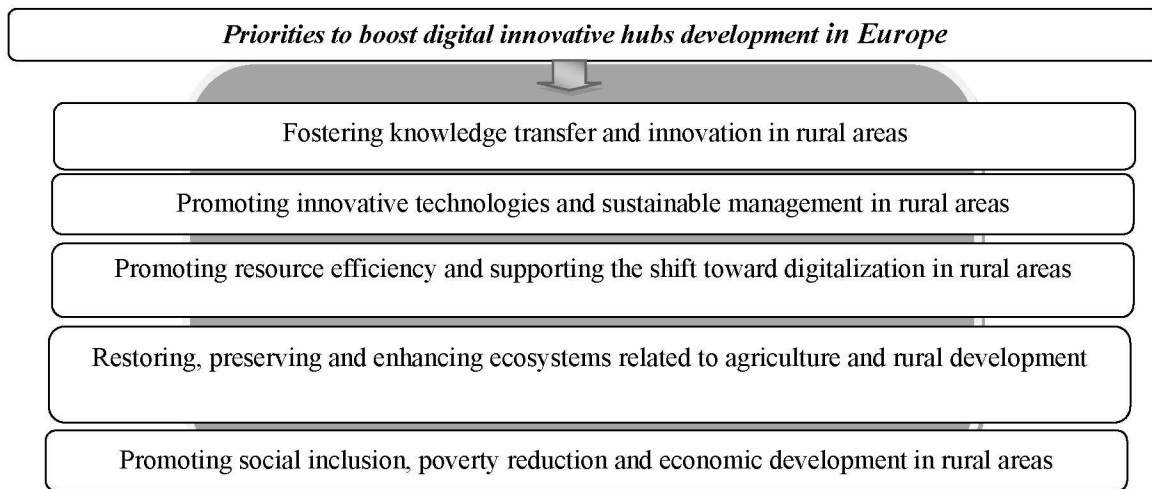


Figure 4. Opportunities to boost digital innovative hubs development in rural areas

These opportunities are considered within the European structural investment funds (ESIF) and the European agricultural fund for rural development (EAFRD), providing financial instruments to support digital innovative hubs and strategies for their development in rural area. The EAFRD budget for the 2014-20 period amounts to around €100 billion. The budget will be spent over the course of this period, through the implementation of rural development programs which run until the end of 2023 (European Commission, 2017). Many opportunities for digital innovative hubs development in rural areas are created under the Horizon 2020 instrument within the SmartAgriHubs program of €20 M. The program supports a consortium of about 164 partners from European rural business representatives. The project aims to foster a rural innovation ecosystem dedicated to excellence, sustainability and success, supporting digitization in rural area. The development and adoption of digital solutions is achieved by a tight ecosystem of Digital Innovation Hubs embedded within nine Regional Clusters, which are led by organizations that are closely involved in

regional digitization initiatives and funds.

Conclusions

The conducted scientific research dealing with the challenges and opportunities for digital innovative hubs development in Europe allowed to draw the following conclusions:

1. European experiences show that innovative digital hubs face many challenges. The main challenges faced by many hubs in rural area are the slow broadband, lack of access to high skilled labour, weak infrastructure links and accessing finance.

2. Despite the complexity of hub development in rural area, digital innovative hubs provide a measure of opportunities, including: strengthening the ability for digital transformation in European rural society, especially by creating a common area for digital services in rural area; strengthening the competitiveness of rural business through digitalisation; enhancing the digital single market in Europe.

3. The increase of ICT access for rural business is possible within all-European programs to finance innovative digital hubs

development and their capacity increase, increasing research and innovation investments.

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