

Abstract

Leveraging Industry 4.0 for Supply Chain Collaboration: Creating Competitive Advantage for Small Farms in the United Kingdom and Ukraine [†]

Leila Masoomi ¹, Olena Taran-Lala ², Charlotte V. L. Smith ¹ and Hana Trollman ^{1,*} 

¹ School of Business, University of Leicester, Leicester LE2 1RQ, UK; lm557@leicester.ac.uk (L.M.); cvls1@leicester.ac.uk (C.V.L.S.)

² Entrepreneurship and Law Department, Poltava State Agrarian University, 36003 Poltava, Ukraine; elenalala1704@gmail.com

* Correspondence: ht203@leicester.ac.uk

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The aim of this research is to comparatively analyse the potential for implementing Industry 4.0 technologies in agri-food supply chains for the benefit of small farms in the United Kingdom (UK) and Ukraine with a focus on enhancing their capabilities and competitiveness. The promotion of local food systems and short supply chains is supported for enhancing the resilience of the food system, particularly during crises, while also improving environmental impact. Local farms play a crucial role in minimizing the environmental consequences associated with long-distance food transportation. Additionally, they positively impact the local economy by supporting farmers and businesses, and foster sustainable agriculture practices through supply chain transparency. However, small- and medium-sized enterprises (SMEs) and small farms face specific constraints compared to larger enterprises. These constraints include reduced economies of scale, increased costs, limited resources, and low efficiency. Poor linkages and communication in the agri-food supply chain exacerbate these challenges, whilst cyber security and integration with legacy systems may not be compatible with new Industry 4.0 technologies. Despite the necessity to adapt to Industry 4.0 and utilize digital technologies in agriculture, obstacles persist, including limited technological literacy, inadequate human resources, network coverage, and capital support, which hinder the full potential of smart agriculture in both the UK and Ukraine.

Considering the specific needs and constraints of each farm when planning and implementing Industry 4.0 technologies is critical. In addition, government support, education and access to finance can contribute to the successful implementation of Industry 4.0 in British and Ukrainian agriculture. According to the resource-based view (RBV), organizations have the capacity to develop dynamic capabilities by utilizing and reconfiguring their resources. Social network theory complements the RBV, emphasizing the role of network structure and partner characteristics in gaining access to external resources. This study adopts a comparative analysis of small farms in the UK and Ukraine based on the application of the RBV and social network theory. An analysis of how small farms in the UK and Ukraine can create competitive advantage by adopting blockchain and IoT technologies in vertical and horizontal supply chain collaboration is presented. By leveraging technology and enhancing collaboration, small farms in the UK and Ukraine can overcome resource constraints, improve efficiency, and achieve sustainable growth in a competitive market environment.



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