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Artificial Intelligence (AI) in rural business: Network engagement and SME factors effects on AI use

Topic: Research on AI is increasing in prominence in Entrepreneurship, but remains a topic that is under-researched. This is especially true for rural-based SMEs, with limited research on the adoption and application of AI among rural SMEs. It is apparent from the literature that rural SMEs are usually constrained by limited resources due to their location, and characterised by being more passive to opportunities for growth, innovation, and technology adoption. They are also less likely to benefit from spillover effects, which are more apparent within urban-based SMEs. Consequently, this research aims to develop a deeper understanding of models of AI adoption and usage, specifically in SMEs, and then enhance insight of the persistence of AI usage in SMEs.

Evidence from existing literature indicates that benefits can be derived from AI adoption by SMEs. Based on this pejorative view, there have been studies that identify the barriers to adoption of AI technologies, however B2B literature points to a long tradition of network research, relationships and innovative practice. There is growing evidence that networks are important to the adoption of AI, yet questions remain about what AI enabling partnerships might look like. Even for network members, the power dynamics and technical competencies have been identified as areas of interest.

Applicability to the conference theme – “Entrepreneurship research, policy and practice for a more equitable world”: Rural areas have a number of well-known issues which inhibit their ability to function when compared to urban operations. One such issue is the ‘digital divide’ with the rural areas facing a far more challenging environment. We also suspect an AI divide between rural and non-rural locations, with SMEs in urban areas for example having greater access to not only internet, but also capable staff. AI has been argued to ‘leave behind’ and also ‘impact upon’ various (including vulnerable) groups. This study aims to address this potential issue. To do this a focus on rural SME’s who have adopted AI will be investigated, with attention paid to their networks as a facilitating factor.

Aim: To better understand the adoption and use of AI in rural SMEs, the aim of the study is to look beyond business characteristics and explore the network engagement effects on AI adoption and usage. Thus, creating a fuller understanding of AI adoption and usage in rural areas. By profiling the SMEs that have used AI, we are able to assess the potential spillovers to local economies. Thus, informing debate around the benefits versus harm of AI in rural areas.

Methodology: The research aims are addressed using the Longitudinal Small Business Survey (LSBS), a major UK based study of SMEs across a variety of sectors, with numerous waves of data completed since its inception in 2015. The research uses a combination of methods, including descriptive analysis and regression. The LSBS includes 9492 SMEs in the sample, with 3040 classified as rural. Given the nature of the data, a fuller picture of networks and AI is enabled using descriptive analysis. This will help identify the potential effects of AI. Using regression analysis, the effects of various SME characteristics and network effects can be better understood.

Contribution: The paper contributes to knowledge on AI adoption among SMEs, a topic which is emerging within Entrepreneurship literature. The current literature has little about

rural SMEs adoption and use of AI, thus this research attempts to remediate that. In doing so, the opportunity for AI to advance rural economies will be analysed. While previous research on rural SMEs shows that they tend to be more passive to technology and innovation adoption, it appears that AI is of benefit to rural SMEs and there are potential spillover effects for local economies. A number of SME characteristics and network effects drive the use of SMEs, while there are also some factors which inhibit the adoption or use.

Implications for policy: Policy makers can potentially use the research findings to inform decisions around AI support in rural areas. This is important, as previous research shows that rural SMEs depend on support due to their limited resource allocation and their lesser likelihood to benefit from spillover effects. By profiling rural SMEs who have and who are not adopting or using AI we are able to generate insights. As part of this, the potential benefits and harm to rural areas from AI can be better understood, thus support packages can be used to enable AI, or to mitigate its impact in rural areas.

Implications for practice: Practical implications of this research would provide SMEs with a better understanding of how AI is being used in rural areas, and could enable rural-based SMEs to be better informed about how they could approach the adoption of AI in their activities. This could help rural SMEs to consider a strategy for AI adoption within their business activities, and promote innovative practice.