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Understanding Artificial Intelligence Adoption and Use in Rural Small Medium Enterprises: An Opportunity to Level Up?

Dr. David Dowell

University of St Andrews
djd9@st-andrews.ac.uk

Dr. Wyn Morris

Aberystwyth University
dmm@aber.ac.uk

Dr. Robert Bowen

Cardiff University
BowenR16@cardiff.ac.uk

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NON-TECHNICAL SUMMARY

Artificial intelligence (AI) is considered as the 4th Industrial Revolution, or as the Industrial Revolution for human intellect. AI is software that mirrors and produces human like behaviours, responses and decision making. Essentially AI mimics human cognitive functions. AI can scale human intelligence for SME use, as such, AI attracts the attention of SMEs and academics alike.

A sometimes-balanced debate has emerged that there will be gains from AI adoption, in terms of productivity and creativity. However, there will be anticipated losses of jobs to offset the economic and productivity gains. For rural SMEs if the negative were to be true the effects on local economies could be devastating with potential gains offset by lower employment.

There is a known and well researched rural-urban divide in technology access and adoption. This extends into innovation rates, with innovation of process and goods/services lower. Within rural SMEs there is divergence with technology access and use, as well as innovation levels and adoption. The adoption could be limited owing to the digital divide and lesser uptake rates of innovation.

Rural SMEs face substantive issues with regards to location beyond technology. There is a series of confounding macro factors, such as climate change and Brexit which impact upon rural SMEs disproportionately. This calls for smarter operations in areas such as transportation (climate change) and human resource management (Brexit). These are examples and areas in which AI could be advantageous, based on transport allocation and intelligent rostering.

Our findings show that AI use differs between rural and urban based SMEs. However, of more interest is the difference between rural adopters and non-adopters of AI. We identify fundamental differences between the two groups. Our aim is to better understand why some SMEs have adopted AI and why some have not. Essentially the analysis identifies differences between adopters and non-adopters, and analyses what drives the decision to adopt.

In profiling the rural SMEs who have adopted, these tend to exhibit positive intentions, with a higher proportion indicating they expect increased turnover and growth. Interestingly, the SMEs who have adopted are more likely to increase staff levels going forward, more likely to invest in training staff and to have a positive outlook on their strategic future. The SMEs who have already adopted AI are not looking to reduce staff, nor close sites of operation.

Consistent with prior findings our results indicate that the SMEs who have adopted a new technology, in this case AI, tend to have a larger number of employees and turnover. Thus, in general the results indicate that expansion and development is more likely with AI adopters.

Our findings also signify that belonging to a network is a key contributing factor to adopting AI technology. This may be challenging for rural SMEs as, by nature, they do not exist within an industrial cluster and may not benefit from co-location advantages seen with urban SMEs.

In terms of future plans, rural AI adopters indicated higher levels of intentions to export in the future and expressed a greater interest in research and development. Hence, the AI adopters are not only doing more now but are planning more in the future.