

ICT Adoption by Rural Accommodation: A Preliminary Study in Scotland

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Abstract

The work described in this paper is of direct relevance to those with an interest in the phenomena surrounding ICT adoption by the rural accommodation sector. The paper provides results from a preliminary study, which examined differences in the level of inter-firm technology adoption between rural and urban accommodation establishments within a major tourism destination, Scotland. Previous studies examining these phenomena within other industries suggested that rural businesses tend to have weaker technology adoption than those located in urban settings. However, they fail to provide any conclusive explanation for these differences. The results set out here suggested that these differences are only presented with two different aspects of technology, i.e. systems requiring Networking Infrastructure, and sector-specific applications. Theoretical and industry implications, as well as suggestions for further research are presented.

Keywords: ICT adoption, rural businesses, growth and innovation, accommodation sector, tourism

1 Introduction

The business literature suggests that those establishments located in rural settings tend to present lower levels of ICT adoption (de Noronha Vaz, Morgan, & Nijkamp, 2006). And therefore, the OECD supports ICT adoption within these settings (OECD, 2001). Similarly, it is suggested that technology may have at least similar levels of impact on the tourism activities taking place in rural settings (Premkumar & Roberts, 1999). This paper presents the results from a foundation study which examines the different patterns of ICT adoption by hospitality businesses in rural and urban settings. The results support the assessment of two major theories of growth for explaining the phenomena of technology adoption in rural settings.

2 Literature Review

Two main theories aim to explain the lower levels of ICT adoption in rural settings. One is based on the stages of growth models (Greiner, 1972) and the other is based on Stöhr's (1981) work.

According to Greiner's (1972) models, the growth and development of organisations, which includes technology adoption, is a form of evolution. And this evolution can be described by a determined succession of sequential patterns (Burn, 1994). Those studies based on this theory envision the phenomena as an end on itself. They are focused on the identification of the stages of adoption (King & Teo, 1997), and on detecting the interfering effects, including a) rank, b) stock-order, and c) epidemic (Bocquet & Brossard, 2007). Based on these principles, the neoclassical economic theory considers spatial manifestation as the growth centre concept (Stöhr, 1981). According to this theory, growth takes place due to external influence and impulse for innovation. According to these Studies, epidemic effects are the cause behind the technology divide between rural and urban areas. The lack of knowledge about ICT (Huang, 2008), of awareness about its benefits, together with the limited infrastructure (Bourgouin, 2002) are considered the fundamental barriers for ICT adoption. And accordingly, the OECD (2001) considers that the lower levels of population and educational levels, together with the lack of infrastructure reflect on the lower levels of ICT adoption on rural areas.

However, some scholars (Stöhr, 1981) consider that the neoclassic theory mistakenly presupposes that there is only one path of growth and development. According to these researchers this theory has policy implications, as it places limitations for innovative paths of development. This stream of thought has led to what has been known as *development from below*. These theorists consider that development takes place by maximising the mobilisation of each area's natural, human, and institutional resources with the primary objective of satisfying the needs of the inhabitants of that area. In these regards, policies should be specifically developed for those areas where they will be implemented. And there will be mistrust on those policies which are transferred from other areas. If this is the case, different technological requirements could be arisen at businesses located in different settings. And in the context of this project, it could imply that establishments located in rural settings may have different technological requirements.

According to (Rogers, 1969) the characteristics of the innovations underlie the influence that business characteristics have on adoption. Nevertheless, to the knowledge of the researchers, no previous study has examined ICT adoption in rural settings attending to the characteristics of the individual technologies. Hence, the following research questions have been developed: 1) Do establishments located in rural areas present different levels of ICT adoption to those located in urban areas? And if this is the case 2) are these differences equally presented in the adoption of all the systems? And finally, 3) what theory of growth is more suitable in explaining the phenomena surrounding ICT adoption by accommodation establishments located in rural settings?

3 Methods

In an attempt to examine these research questions, an electronic survey was developed through the Scottish accommodation sector. The questionnaire collected information on the availability of ICT, aligning with the eTourism literature (Buhalis, 2003; Murphy et al., 2003; O'Connor, 2004; Schegg et al., 2003), in relation to Front-Office, Business Administration, Yield Management, Business Intelligence, Guest Service, Hardware and General Networking Infrastructure. Additionally, it collected information regarding the location of establishments in rural or urban areas, for comparisons between these areas.

The most accurate record of the accommodation sector is that one held by VisitScotland (Public body, responsible for the Scottish tourism marketing). The accommodation sector database held by VisitScotland, comprised 7,671 establishments. A response rate of 6.9% was achieved, with 477 valid questionnaires. The sample error for an infinite population was of about 4.49% for a confidence level of 95.5% ($p = q = 0.5$) which previous studies have suggested as acceptable (Reichel et al., 2000).

The data analysis included two main statistical techniques. Firstly, contingency tables and the Chi-Square Test were developed. When the assumptions related to the minimum expected cell count were not met, the Fisher Exact Test, which is assumptions-free, was carried out.

4 Findings

The analysis through contingency tables revealed that those establishments located in rural areas tend to present significantly lower levels of technology adoption than those businesses at urban locations. Similarly to the findings from that previous research which was carried out on other business domains (OECD, 2001), these results indicated that overall, the level of technology adoption is lower at those accommodation establishments located in rural settings than those in urban areas. However, the results from the Chi-Square Test suggested that this influence is only statistically significant ($p < 0.05$) in a limited number of systems, which are presented in Table 1. As it can be observed, this table only includes systems requiring networking infrastructure and some sector-specific applications. On the other hand, with the exception of those systems requiring networking infrastructure, those applications supporting the activities of different business sectors (horizontal applications) failed to present statistically significant divergences in their level of adoption by rural establishments.

Table 1. Influence of Location on ICT Uptake

		Rural	Urban
Vertical Systems	Property Management Systems	8%	15.9%
	Global Distribution Systems	5%	9.6%
	Alternative Distribution Systems	12%	23.6%
Requiring Network	Remote Access to Company Network	11.6%	18.5%
	Company Website	84%	91%
	Intranet	5.6%	15.3%
	Pay-as-you-go I-R Internet	2%	5.1%
	Free I-R Internet	18%	30.6%

5 Conclusions, Implications and Outlook

Previous studies, from other domains, examined the phenomena of ICT adoption in rural settings. These studies suggested that rural businesses tend to adopt less technology than those located in urban settings. However, the review of the literature suggested lack of consensus over a theory explaining this phenomenon.

The results indicated that those businesses located in rural settings tend to present lower levels of ICT uptake. However, this influence is only presented on the adoption of a specific set of systems, including sector-specific applications and applications requiring Networking Infrastructure. Accordingly, the reasons for these differences seem to be two-fold. On one hand this provides evidence of epidemic effects influencing ICT adoption in rural areas, as suggested by the neoclassical theory of growth. On the other hand, this suggests that sector-specific applications might not fulfil the requirements of rural accommodation establishments, as suggested by the followers of Sthör's (1981). Hence, the application of the two major theories of growth for explaining ICT adoption in rural areas is not necessarily contradictory. In turn, the results suggest that these complement each other. In addition to the theoretical implications, these findings are also of importance to the industry. On one hand, they suggest limitations related to Networking accessibility in the Scottish rural areas. On the other hand, they suggest the different ICT requirements of rural establishments, which translate in opportunities for software development. This research is exploratory. However, it has provided a valuable foundation study for further research.

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