

Diffusion of Innovation – the Adoption of Electronic Commerce by Small and Medium Enterprises (SMEs) in Regional Australia

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Abstract

Many variables can influence the likelihood of innovation adoption. Analysis of these variables suggests that further research needs to be conducted to better understand the process of adoption. This paper explores the issues that influence the diffusion of innovation as it relates to the adoption of e-commerce by Small and Medium Enterprises (SMEs) particularly in regional areas. While it is generally accepted that the strategic use of Information Technology (IT) is vital in the marketplace, SMEs, especially those in regional Australia, are lagging behind.

The paper examines existing theory as it pertains to the diffusion of innovation from the perspective of regional SMEs. A research study is outlined to identify the causal factors responsible for this lack of uptake of IT. It is critical to understand such factors so that steps can be taken to redress this inequity and positively influence the acceptance and use of IT innovations in SMEs in regional Australia.

An empirical investigation is planned to explore this diffusion and the slow rate of uptake by SMEs. This investigation will use a survey, preceded by focus groups, to uncover factors influencing the adoption or non adoption of IT innovations by SMEs.

Introduction

Small and Medium Enterprises (SMEs) have a critical role to play in the Australian economy. Despite advances in information technology and acceptance by large organisations of such technologies, the same level of adoption is not evident among SMEs (Bode & Burn 2002; Knol & Stroeken 2001).

Participation in e-commerce is important from the perspective of commercial transactions. Even more importantly it encourages transformation of internal systems and subsequently influences cost, responsiveness to customers, customization of offerings and the potential emergence of new products and services (Crawford 1998, p.6).

From this viewpoint it is considered that the uptake of e-commerce by SMEs in regional areas requires further study. This research plan addresses the following research questions in relation to regional SMEs in Australia:

- To what extent do diffusion of innovation models apply;
- What are the factors that influence the adoption of e-commerce among SMEs;
- What are the reasons for the slower than anticipated rate of adoption of e-commerce; and
- Do inequities exist regarding the rate of diffusion of ecommerce by SMEs in regional versus urban areas?

These research questions will be addressed in the proposed research, using the Hervey Bay region of Queensland as an example. These issues and a number of hypotheses identified in the paper will be tested by way of focus groups and a survey of SME proprietors.

Uptake of E-commerce by Small and Medium Enterprises

Crawford (1998, p.20) argues that while access to the Internet is relatively inexpensive and readily available, smaller enterprises have been slow in using this as a low cost introduction to e-commerce. The main reasons cited for this reluctance were a lack of time, lack of awareness and a lack of business opportunities. Crawford also notes some impetus for change is vital for e-commerce to be considered.

Brown (2002) identified a number of factors limiting the adoption of e-commerce:

- E-commerce was seen to be a distraction from core business
- Significant perceived cost and risks associated with e-commerce
- Lack of strategic vision
- Lack of realisation of value/benefits of e-commerce to individual SMEs

Most SMEs adopt e-commerce in a 'just-by-chance' or casual manner, rather than as a consequence of systematic consideration and planning (Engsbo et al. 2001; Scupola 2002). Jocusen (2002, p14) describes the decision making process of SMEs as being much less complex compared with what is suggested by theoretical frameworks, with 'extensive use of learned competencies in the form of 'perceived' rationality and the use of rudimentary analytical tools'. The lack of real specific awareness which was also identified by Brown (2002), is considered to be a substantial obstacle to the uptake of e-commerce.

Stroeken and Coumans (1998, p. 227) note that there is a lack of strategic insight of entrepreneurs/proprietors in relation to 'altered product options as a result of the introduction of IT, the alternative market and customer approach, and the desired forms of co-operation' required to make it work, and this they believe, inhibits the application of IT within SMEs.

Diffusion of Innovation models

Understanding how organisations decide to change (Moseley 2000) is critical to making sure such change (and the methods by which this change is introduced), are effective. The various

Diffusion of Innovation models helps identify reasons for the unsuccessful implementation of change (Baskerville & Pries-Heje, 2001).

Innovation is 'an idea, practice or object that is perceived as new by an individual or other unit of adoption' (Rogers 1995, p.11). An innovation is not an invention, it is 'doing something which did not exist before in a particular territory or technical area' (Vuarin & Rodriguez 1994, p.15).

Diffusion is the 'process by which an innovation is communicated through certain channels over time among the members of a social system' (Rogers 1995, p. 5). The existence of a social system is important when considering the uptake of e-commerce and the relative rate of adoption within regional/rural areas compared with urban regions. The authors hypothesise that there is a lower level of awareness and a different message 'shared' via the social system in which regional SMEs find themselves. The role of the milieu and the subsequent communication within networks (which would include competition) is one that requires further investigation.

An emerging model of innovation is based on the premise that diffusion is unstructured and is stimulated by shock either internal or external to the organisation, rather than being a stepwise and rational process (Baskerville & Pries-Heje 2001; Van de Ven, Angle & Poole 1989). It can be argued that innovation diffusion is an 'unstructured emergent phenomenon' (Baskerville & Pries-Heje 2001, p.187).

Wejnert (2002) posits that the adoption process is not uniform and differs based on the nature of the innovation itself, the innovators and the environmental context within which the organisation is placed. The authors hypothesise that for regional SMEs these factors differ markedly from those in urban regions, particularly with regard to the characteristics of the innovator (or the proprietor) and the organisation including such things as organisational readiness, attitude to risk, knowledge and experience with e-commerce.

Interactive models such as those developed by Burgelman and Sayles (1986) use both technology-linking and need-linking to realise successful innovation diffusion (Baskerville & Pries-Heje 2001). In this model a technical breakthrough achieves context within actual or potential market demand (Lucas, 1994). From this perspective the question arises as to what extent do market needs drive technology adoption or vice versa for SMEs in regional areas. It is the authors' hypothesis that neither of these occurs and this, in part, explains the lack of adoption of e-commerce. It is also hypothesised that the 'shock' which can precipitate such adoption for SMEs is reactive (a forced decision) or occurs 'just-by-chance' rather than being strategic in nature.

Rogers (1995) postulated that innovation was more likely to succeed and be more readily adopted if the relative advantage as a consequence of its introduction was evident; if it was compatible with the organisation, its operations and its view of the world; if it was not 'too' complex; and if it was trialable and could be observed prior to adoption. Local initiatives in the Hervey Bay area have attempted to embody these factors (Pease & Rowe 2003a, 2003b; Pease, Rowe & Wright 2003).

The diffusion of innovation model (Rogers 1995) identified a number of categories of adopter, based on the speed with which they adopted the innovation. The question is what the profile of *innovators* and *early adopters* is, and to what extent are these individuals likely to reside in regional areas? Griffiths et al (1986) argued that organisations must possess certain traits if innovation was to have a greater chance of success. These include skill, expertise and experience, management support, approach to risk and leadership. Rogers (1995) and Ruttan (1996) have found that there are three main characteristics that describe *innovators* and *early adopters*:

- Their business or professional circumstances: early adopters tend to have a pressing problem, i.e., a clear gap between the actual and the desired and have access to the resources necessary to change their current practice;
- Their personal attributes: early adopters tend to have good formal education, relatively high socio economic status, are socially mobile, open to new ideas and able to cope with risk and uncertainty;
- Their connections: early adopters tend to be exposed to a variety of media, to be well connected in interpersonal networks and to have good contacts with opinion leaders, change agents and other early adopters (Moseley 2000).

Recent research focuses on the importance of the third of these factors, reflecting the view that ‘innovation is a social rather than a solely individual process...occurring among a variety of stakeholders rather than as a matter of transfer or dissemination of technology or ideas’ (Engel 1997, p.125). Networking and relationship building, for example, among SMEs is critical to this. Analysis of social networking within urban and regional areas requires further consideration.

Diffusion is about reducing uncertainty ‘among members of the social system by means of communication’ (Knol & Stroeker 2001, p.229). For SMEs this is largely by way of interpersonal channels with learning being critical to the adoption and implementation of complex innovations. Promotion of the adoption of e-commerce should include the use of appropriate media to transmit information, the encouragement of early adopters to converse with their peers, targeted training and education programmes, the deployment of facilitators to inform and persuade potential innovators, the identification and support of opinion leaders, the issue of incentives to promote some early trial adoptions, and the promise of ongoing support (Moseley 2000).

The Challenge in Regional/Rural Areas

Rural development requires a mass of innovation decisions to be taken by individuals, households, firms and voluntary and public bodies in areas devoid of scale or agglomeration economies, replete with problems relating to remoteness and an urgent need to restructure the economic base (Moseley 2000).

Initiatives largely established by the Australian Government (National Office for the Information Economy 2003) reflect the need to restructure the economic base and provide access to infrastructure in regional areas. The Eastens Regional Telecommunications Inquiry (Department of Communications, Information Technology and the Arts 2002, p.205) considered that ‘access

to higher bandwidth services is becoming vital for the economic and social development of regional, rural and remote Australia. Adoption of a new way of doing things by SMEs, among others, is arguably fundamental to bringing about change in regional areas insofar as it facilitates the emergence of the new economy.

There are numerous barriers to the adoption of e-commerce by regional SMEs. These are largely however internal in nature given the initiatives that have been put in place. Nevertheless these are 'real' potential barriers which need to be addressed. Empirical research needs to be conducted to identify the current situation so that appropriate actions can be initiated.

Research Objectives

The objectives of the research are to identify factors influencing the adoption of innovation, specifically e-commerce and to address the research questions outlined earlier. This paper draws upon and reports part of a long term research project that aims to identify factors affecting the uptake of e-commerce by SMEs in regional Australia, initially by way of looking at the state of play in one region, Hervey Bay, Queensland.

Research Methodology

The study initially involves exploratory research by way of focus groups which is a suitable methodology to determine this style of research question that is concerned with 'how' and 'why' (Morgan 1997; Leonard-Barton, 1988). This methodology was selected given the exploratory nature of the research and since it provided a non-threatening environment whereby participants, local SME proprietors, could discuss these issues and interact via open discussion.

The focus group discussions will be structured centring on the questions that will be contained in the survey instrument to be administered. The questionnaire has been shaped specifically to identify what SMEs understand by e-commerce, to identify factors triggering or impeding its adoption, to identify time taken to consider whether to adopt e-commerce, and to identify the benefits from, or expected from, and difficulties associated with e-commerce.

The instrument has been pretested and modified to increase clarity, particularly regarding its branching. The feedback and comments from the focus groups will be taken into account and further modification of the questionnaire will be undertaken to maximize the ease and likelihood of response.

One hundred SMEs will also be surveyed, selected randomly from a sampling frame of SMEs located within the Hervey Bay region. The instrument will be distributed by mail, including a stamped self addressed envelope, rather than telephone to enable proprietors to complete in their own time and to provide access to firms regardless of e-commerce adoption. A follow up telephone call two weeks after date of distribution to encourage response will be made.

The findings from the focus groups and responses to the survey instrument will be analysed to identify the factors at play both triggering and hindering the adoption of e-commerce within the Hervey Bay region and to deal with the hypotheses/propositions posed here.

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