

# The University of Bradford Institutional Repository

<http://bradscholars.brad.ac.uk>

This work is made available online in accordance with publisher policies. Please refer to the repository record for this item and our Policy Document available from the repository home page for further information.

To see the final version of this work please visit the publisher's website. Where available, access to the published online version may require a subscription.

Author(s): Lockett, N., Brown, D.H. and Kaewkitipong, L.

Title: The Use of Hosted Enterprise Applications by SMEs: A Dual Market and User Perspective

Publication year: 2006

Journal title: Electronic Markets

ISSN: 1422-8890

Publisher: Taylor & Francis: Routledge

Citation: Lockett, N., Brown, D.H. and Kaewkitipong, L. (2006). The Use of Hosted Enterprise Applications by SMEs: A Dual Market and User Perspective. *Electronic Markets*. Vol. 16, No. 1, pp. 85-96.

Link to published version:

<http://www.informaworld.com/smpp/content~content=a741440860~db=all~order=page>

Copyright statement: © 2006 Taylor & Francis: Routledge . Reproduced in accordance with the publisher's self-archiving policy.

# **The Use of Hosted Enterprise Applications by SMEs:**

## **A Dual Market and User Perspective**

Dr Nigel Lockett, Prof David H. Brown and Laddawan Kaewkitipong

### **Abstract**

This deliberately dual perspective paper seeks to deepen our understanding of the engagement of SMEs in hosted enterprise applications in the UK. The emergence and development of the ASP sector has attracted much interest and highly optimistic forecasts for revenues. The paper starts by considering ICT adoption by SMEs in general before reviewing the provision of hosted enterprise applications in the US and UK (market perspective). The study is extended by qualitative empirical data collected by semi-structured interviews with SME users of hosted enterprise applications (user perspective) and subsequent analysis in order to develop the key findings and conclusions. From an SME user perspective the key findings to emerge from the study include: i) confirmation that ICT infrastructure was no longer a barrier to adoption, ii) the pragmatic approach taken to security issues, iii) the use of both multiple information systems and multiple service providers, iv) the financial attractiveness of the rental model and v) the intention to continue or extend the use of hosted applications. It also highlights the opportunity for gaining competitive advantage by using hosted enterprise applications to reduce costs. There are very few empirical studies of hosted applications which take deliberately market and SME user perspectives - this paper makes an important contribution in this emerging field.

### **Introduction**

The broad relationship between small and medium sized enterprises (SMEs) and their use of information and communication technologies (ICT) is problematic. On the one hand the most recent survey by the EC E-Business Watch, which tracks e-business engagement across 15 industry sectors throughout all EU member states, concludes that access to ICT is no longer a barrier to e-business uptake by small businesses with connectivity at 84 percent. Simple applications such as e-mail and Web access are virtually ubiquitous (EC, 2005). On the other hand, however, usage by SMEs of higher complexity applications, such as integrated financial ledgers, supply chain applications, and customer relationship management (CRM) applications (DTI, 2004) and hosted applications (Scottish Enterprise, 2002) is much lower. It is against this background that our paper reports some current research, which aims to deepen our understanding of the factors that are relevant to the adoption of

these higher complexity applications by UK SMEs. This research is characterised in three ways. Firstly, it focuses on hosted applications since this mode of provision is growing and is potentially of significant interest to SMEs. Secondly, it includes a market perspective of the emerging service offerings targeted specifically at SMEs in the US and to a limited extent in the UK. And finally, the research incorporates an explicit user perspective. This latter element is important and is revisited later in the paper. The presentation and interpretation of the research is structured into four main sections. The paper starts by considering the nature of a hosted applications environment and within this context explores ICT adoption by SMEs in general, and the importance of application complexity in particular. The methodology and the empirical design are detailed in section two. In the third section a market perspective on the provision of hosted services is summarised. Finally, section four brings together the data analysis and its interpretation of the user perspective to produce the key findings and conclusions. The dual market and user perspective which is central to this study is important in increasing the relevance of this research. Firstly, because whilst recognising the provision of hosted enterprise applications is dominated by US provision it establishes a link between the two UK-based service providers who assisted in providing access to SME users. And secondly, because the findings developed from the qualitative user data can usefully increase our understanding of the use of hosted enterprise applications by SMEs. This latter point is particularly important when viewed in the context of the lack of SME focused empirical research in this emergent market.

### **Hosted applications, adoption and complexity**

As IT functionality and capabilities have changed profoundly and dramatically as a result of new technologies like the Internet and 3G mobile, all firms need more flexibility and adaptability of processes and systems to respond to these emerging challenges and opportunities. Increasingly internal information system development is moving to an external development and provision model (outsourcing), driven by the need for lower costs, faster implementation, easier-to-use applications and effective use of scarce resources (Ward and Peppard, 2002). The emergence of hosted e-business enterprise applications is a prime example of a profound change deriving directly from the availability of a low cost, ubiquitous electronic communication network - the Internet. Here e-business is defined as: 'the use of electronic communication networks to transact, process and collaborate in business markets.' Hence in this definition e-business incorporates e-commerce (Lockett and Brown, 2006a). These hosted applications provide e-business functionality ranging from e-mail to contact management and from sales order entry to financial ledgers with report generators. Telecommunication, technology and service companies have emerged or evolved to provide a range of

Web services and hosted applications designed to exploit existing communication infrastructures. Typically these are known as application service providers (ASP) that:

‘provide a contractual service offering to deploy, host, manage and rent access to an application from a centrally managed facility, responsible for either directly or indirectly providing all the specific activities and expertise aimed at managing a software application or set of applications.’ (Gillian et al., 1999).

The provision of hosted applications, by ASPs, on a rented basis is viewed as of particular relevance to SMEs. Ward and Peppard (2002) place application service provision within the context of outsourcing strategies and note its particular role in selective outsourcing. They state that ‘ASPs primarily target SMEs that cannot afford their own IS functions’ (2002: 574), but conclude that customers remain to be convinced. The new hosted applications that facilitate e-business are very different from traditional resident applications in one main regard, namely that the user interface, application software, data processing and data storage can be located on different and multiple software and hardware platforms, and can be provided and supported by different entities, Figure 1.

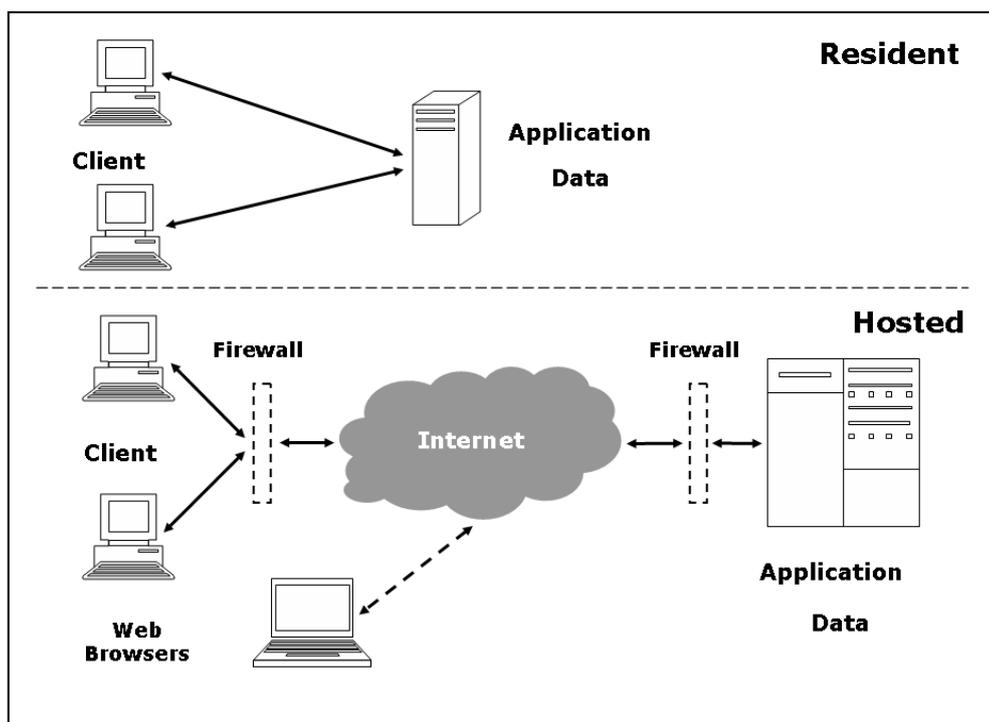


Figure 1. Architecture for e-business applications (Lockett and Brown, 2006b)

ASPs form part of the wider service provider (xSP) sector, which includes, storage service providers (SSP), content service providers (CSP), wireless ASPs (WASP) and others. The ASPs themselves fall into two main categories – vertical and horizontal. About 12 percent of ASPs are involved in service provision and support to specific industries and are defined as vertical; the dominant balance is

horizontal ASPs capable of offering services across multiple industries (Currie et al, 2004). In this research it is the horizontal ASPs that provide the focus. Hosted ASP applications are in essence online services accessed by the user via a simple interface, such as a Web browser, over electronic communication networks, such as the Internet. This fundamental change in the relationship between user, hardware and software and presents opportunities for new business models for service provision. Typically these hosted applications are offered on a rental or fee basis, rather than the traditional purchase model. The fee normally includes the use of the software and the provision of the processing and storage platforms, but not the provision of the electronic communication networks. Importantly, these electronic communication networks are increasingly being considered as ubiquitous and are rapidly evolving from the public Internet through virtual private networks to grid computing and 3G mobile platforms (Lockett and Brown, 2006b). They provide the communication platforms on which ASPs can deliver hosted services. The ASP model has a particular potential for SMEs that do not have their own in-house IT development capability or the necessary level of computing infrastructure. To begin to understand the issues involved in e-business engagement we need to classify hosted applications, as there are significant differences between e-mail and e-marketplace applications both in terms of complexity and added value, Table 1.

Importantly this classification of application complexity stresses the roles of collaboration and interaction as key features of e-business applications, and recognises the resultant increase in complexity. The classification of e-business complexity incorporates both technical and organisational factors. For example, both the security technology issues underpinning higher complexity hosted applications, and the perceived commercial risk of storing sensitive client information in third party data centres, increases with higher complexity. In this way application complexity provides a meaningful framework in which to consider, compare and analyse e-business engagement. The

Classification	Examples	Complexity
Communication	E-Mail, web access	Very Low
Marketing	Website	Low
Productivity	Microsoft Office, intranet	Low
E-Commerce	Buying & selling online	Medium
Collaborative	Extranet	Medium
<b>Enterprise</b>	<b>Accounting, payroll, vertical applications</b>	<b>High</b>
Marketplace	E-Marketplaces	High
Collaborative enterprise	Supply chain management, CRM management	Very High
Collaborative platform	Emerging platforms	Very High

**Table 1. Classification of application complexity after Gillian et al 1999 (Brown and Lockett, 2001)**

introduction of the EC E-Business Watch synthesis report represented an important move towards tracking e-business engagement (EC, 2005). It stated the use of e-mail and the www has become nearly ubiquitous in the business world. However this indicates an oversimplification evidenced by the tendency to equate e-business with e-mail usage and Web access. Hosted enterprise applications are high complexity applications and represent a significant increase in complexity over low complexity applications such as e-mail.

The empirical study of ICT adoption by SMEs is increasing but very little of this is concerned with the use of hosted applications (Jutla et al. 2002; Koh and Maguire 2004; Meckel 2004; Lockett and Brown 2005). Most of the research focuses on the drivers and barriers to ICT adoption and some on the strategy or adoption models. This early research on ICT adoption by SMEs is epitomised by Mehrtens et al (2001), which states that perceived benefits, organizational readiness, and external pressure are the major factors in adoption. Indeed, these three factors had been adapted from an earlier study of electronic data interchange (EDI) adoption in SMEs by Iacovou et al (1995). Perceived benefit was also cited as a supporting factor for the adoption in the study of SME use of the Internet by Poon and Swatman (1997). Other influencing factors are business sector and nature (Poon and Swatman, 1999; Fillis et al., 2004; Windrum and Berranger, 2002), owner's enthusiasm and growth ambition (Cragg and King, 1993; Poon and Swatman, 1999; Fillis et al., 2004), and location (Windrum and Berranger, 2002). The role of the intermediary as a means of facilitating the diffusion of complex ICT has been observed by a number of other authors (Swan and Newell, 1995; Newall et al., 2000; Brown and Lockett, 2004). A recent study by Levy and Powell (2003) proposed a contingent model of Internet adoption. Their research reviewed these previously cited factors with the e-business adoption stage model and questioned the idea that small firms progress through a stage (linear) model of growth in their use of Internet-based applications. They investigated 12 case studies to identify the reasons for Internet adoption by SMEs. The case analysis confirmed the results of previous studies that perceived benefit and the owner's attitude to business growth are major factors affecting the adoption decision. Furthermore, a contingent model was developed incorporating these factors and the level of business value and business growth. The contingent model contains four groupings: brochureware, business opportunity, business support, and business development. It confirmed that owners' attitudes to business growth affects adoption and that SMEs with no plans to grow show little enthusiasm for complex technologies and are likely to use only e-mail and Web site hosting (Levy and Powell 2003). The business development grouping in the contingent model confirms that full integration, the highest stage of Internet adoption proposed by Poon and Swatman (1997), and e-business adoption, the last

## The Use of Hosted Enterprise Applications by SMEs

stage of growth model proposed by Willcocks et al. (2000), can only happen when firms can identify significant perceived benefits and have good knowledge of IT opportunities. Clearly more research across business sectors and across countries is needed to substantiate these results. In the main the above literature is viewed from a user perspective. In the case of SMEs the provider perspective is also important since the delivery of high complexity e-business applications can prove unprofitable for providers and many choose not to supply (Brown and Lockett, 2004). In the specific context of ASPs the business model underpinning horizontal ASPs appears more robust than vertical industry specific applications, since the same applications, such as accounting, are used by a wide range of businesses. Even though these applications can be customised they are effectively generic.

Interview structure (sent to companies before the interview)
Interviewee characteristics: Name; position; length of service; qualifications; professional experience; roles and responsibilities; knowledge of Internet/e-business; potential of Internet/e-business
Company characteristics: Name; age; status; ownership structure; organisational structure; approx turnover; profitable; number of employees; history; forecasts; vision/strategy
Company profile: description of product and services; markets/competition; sales channels; operations; supply chain; order processing
Information technology (IT) profile: connectivity; website; which service providers are used; description of information systems used now; history of Internet/e-business; what have been the benefits and drawbacks; how important is information systems to your business; information systems vision/strategy; why ASP (and other providers if used); selection process; security used; barriers & drivers to adoption; map information systems on to sales channels; use of e-commerce (selling & buying) (B2C & B2B) & functionality; future use of e-commerce
External factors affecting adoption of Internet/e-business: pressure from suppliers or customers; competitors/competition; key relationships and partnerships
What functionality is used and why; what functionality is NOT used and why; service levels & satisfaction; what additional functionality would you like ASP to provide; how has using the ASP changed your way of doing business (with customers, suppliers, partners); cost; what is the return on investment (ROI); how was the implementation; future for using hosted applications

**Table 2. Interview structure**

### Research method

A case study (Yin, 2003) based research approach was undertaken in two phases, namely a review of the service offerings (market review) from ASPs, both in the US and UK (May 2005) and semi-structured interviews with senior managers in a range of SMEs using hosted enterprise applications from two UK based ASPs (June and July 2005). Companies selected for the market review were either already known to the researchers or identified by Internet searches. Although this research is UK centric the reason for including US firms in the market review was the reality that they are leading the provision of hosted services and are increasingly offering these services in the UK. The purpose of the market review was to determine the nature of service offerings and functionality, and any evidence of uptake by SMEs. It provided a context within which the actions of the UK firms could be better understood. Analysis took the form of reviewing company Web pages and downloadable documents

## The Use of Hosted Enterprise Applications by SMEs

and industry publications available online. It is acknowledged that there was an inherent bias to the data collected. This was considered an acceptable compromise, however, since our interest was in the nature of the services offered by the ASPs, rather than any commercial claims they made on their market share etc.

The two UK based ASPs were already known to the researchers and agreed to co-operate with the study by facilitating access to SME users. Company one (ASP A) is over 20 years old and is one of the UK's leading IT organisation. It provides a range of software and outsourcing services in the areas of payroll, financial accounting, outsourced software development and application hosting. Company two (ASP B) is less than three years old and only offers hosted applications to the SME sector by providing access to its proprietary hosted enterprise and productivity applications. Qualitative data was obtained from semi-structured interviews (Table 2) with SME users of both ASPs, and covered a range of factors considered to be of potential importance to the firm's decision to use hosted enterprise applications and their subsequent experiences. Companies were selected by respondents to an e-mail from a senior company manager from both ASPs asking *all* their respective customers to participate in the research project. This resulted in comprehensive telephone interviews with senior managers in a range of eight SMEs using hosted applications, Table 3.

Firm	ASP A or B	Company age (years)	Turnover (GBP)	No. of employees	Interviewee's role in the firm
1. Animal feeds supplier	A	100+	Not given	56	Financial Director
2. Timber and building supplies	A	200+	Not given	44	Financial Director
3. Healthcare distribution	A	5	£7.0m	51	Financial Director
4. Promotional merchandise	B	2	£1.4m	9	Financial Manager
5. Events management	B	11	£2.0m	10	Managing Director
6. Corporate uniform supplier	B	5	£2.0m	15	General Manager
7. Sporting club	B	25	Not given	Not given	General Manager
8. Healthcare distribution	B	5	£7.0m	51	Operations Manager

**Table 3. Characteristics of enterprises**

All the interviews were recorded and resulted in 358 minutes of audio files. In order to get a 'sense' of the whole study all the interviews were listened to by the researcher before attempting to codify them. Each interview was codified using HyperResearch ([www.researchware.com](http://www.researchware.com)) and a total of 54 codes were set up and used to support the analysis of the data. These codes emerged as each interview was codified with appropriate voice extracts being attributed to each relevant code. This process was repeated again so that any additional codes added during the codifying process could be applied to previous interviews. An initial report sorted by code was produced and the voice extracts listened to in

sequence. This allowed the researcher to determine whether any extracts were inappropriately coded and to get a sense of the significance of the codes in terms of their frequency and the emphasis of the statements. Finally, each interview was listened to again to see if any significant statements had been missed. Thus this interactive process involved four cycles, namely: i) listening to the audio file with no attempt to codify, ii) initial codifying of each interview, iii) second codifying of each interview against a complete list of codes, iv) listening to each interview once the key findings report had been written. The purpose of the analysis was to support explanation building (Yin, 2003) which facilitates the identification of key findings. This explanation building is special type of pattern matching, which is a more difficult procedure, and has been used for explanatory and exploratory case studies (Yin, 2003:120). Yin also notes that when explaining a phenomenon finding causal links ‘may be complex and difficult to measure in any precise manner’ and he notes that this process ‘has not been well documented in operational terms’ (2003:120). The use of a structured analysis tool in codifying the interviews goes some way to addresses this concern.

### **Market review: a market perspective**

The hosted enterprise applications available to SMEs in the US and UK can usefully be divided into two main types namely, customer relationship management (CRM) and accounting, including payroll. Together these applications broadly encompass the functionality traditionally associated with enterprise resource planning (ERP) applications used by large firms. The market for online or hosted applications offered to SMEs initially developed in the US but is becoming increasingly in the UK. As indicated previously this evolution of hosted enterprise applications necessitated the inclusion of both US and UK service offerings in order to appreciate the context for the subsequent study of SME users in the UK detailed in the next section. The following market review is split into hosted CRM and accounting applications, and includes comparisons with ASP A and ASP B service offerings.

### **Hosted CRM applications**

There are three major US providers of online CRM applications that service SMEs. They are Salesforce.com, NetSuite and Siebel. All the company’s have headquarters in the US, but also offices in UK, Europe, and Asian Pacific. Salesforce.com claims to be the largest provider of hosted CRM applications, delivering integrated, customisable enterprise applications for companies of all sizes around the world. The company stated that it had 267,000 subscribers in 15,500 companies worldwide with 11 local websites in various countries in Europe, America, and Asia, and over \$170 million total revenues in the year ending 31 January 2005 (Salesforce, 2005). NetSuite offers integrated hosted

CRM and enterprise resource planning (ERP) and sales force automation (SFA) applications. The company’s stated target customers are SMEs worldwide (NetSuite, 2005). Siebel’s OnDemandCRM, is a hosted CRM application claiming to offer complete financial, marketing and customer service functionality (Siebel, 2005). Despite offering generally the same functionality, some different features are offered. For example, while NetSuite and Siebel On-demand CRM provide an employee management feature, Salesforce do not include the feature in its product. Table 4 contains a summary of key features available for each company’s products. This comparison indicates that whilst both UK ASPs offer some CRM related functionality this is less than the three US based firms, particularly Netsuite and Siebel.

Company	Salesforce.com	NetSuite	Siebel	ASP A	ASP B
Product name	Salesforce	NetSuite CRM	Siebel OnDemandCRM	Not disclosed	Not disclosed
Market (US & UK) Customer types	US, UK all firms	US, UK SMEs	US, UK all firms	UK all firms	UK SMEs
Features					
Hosted solution	Y	Y	Y	Y	Y
Sales force automation	Y	Y	Y	N	N
Marketing automation	Y	Y	Y	Y	Y
Employee management	N	Y	Y	N	N
Customer support	N	Y	Y	Y	Y
Dashboard	Y	Y	Y	N	N
Productivity tools	N	Y	Y	Y	Y
Customization	Y	Y	Y	Y	Y
Free trial	Y	Y	N	N	N
Number of features (9)	6	9	8	5	5

**Table 4. Comparison of hosted CRM software**

### Hosted accounting applications

There are several major providers of online accounting applications, including QuickBooks Online, ePeachtree and NolaPro. All these providers are primarily based in US, with QuickBooks also active in the UK. QuickBooks Online is owned by Intuit, the largest provider of resident accounting applications SMEs in the US. Intuit states it is transforming business and financial management for small businesses, accounting professionals and consumers (Intuit, 2005). ePeachtree is a product by Best Software, who provide a wide range of front office and back office solutions, including accounting, payroll, fixed asset management, CRM, and e-commerce software in the US. The parent company is Sage Group plc a UK based company that has a large product range of resident applications (Best Software, 2005). Noguska specialises in providing software and networking solutions for businesses, particularly for the printing and graphic arts industries. One of its products is NolaPro, an online system of business management and accounting, including general ledger, accounts

## The Use of Hosted Enterprise Applications by SMEs

payable, accounts receivable, inventory and payroll (Noguska, 2005). Table 5 contains a summary of key features available for each company's products. This comparison indicates that both UK ASPs offered broadly comparable functionality compared to the three US based firms. This supports the case that the findings from any SME users of the UK ASPs might be indicative of SME users more generally.

Company	Intuit	Best Software	Noguska	ASP A	ASP B
Product name	QuickBooks	ePeachtree	NolaPro	Not disclosed	Not disclosed
Market (US & UK)	US, UK	US	US	UK	UK
Customer types	SMEs	SMEs	all firms	all firms	SMEs
Features					
Hosted solution	Y	Y	Y	Y	Y
Basic accounting ledgers	Y	Y	Y	Y	Y
Integrated CRM module	N	N	N	Y	Y
Job and project tracking	N	Y	N	N	N
Free product update	Y	Y	Y	Y	Y
Online support	Y	Y	Y	Y	N
Predefined reports	Y	Y	Y	Y	Y
Data backup	Y	Y	N	Y	Y
Inventory	N	Y	Y	Y	Y
Shopping cart	N	N	Y	N	Y
Free trail	Y	N	Y	N	N
Number of features (11)	7	8	8	8	8

**Table 5. A comparison of hosted accounting applications**

Overall, hosted enterprise applications are becoming more widespread, especially in the US. Unsurprisingly service providers promote the use of these applications and state a range of benefits available to users, including: flexibility, convenience, access (Coursey, 2004; Bartholomew, 2005); focusing on core competence and outsourcing provision and back-up (Company Books, 2005); reduction in hardware, software and maintenance costs (Bartholomew, 2005; BRAL, 2005); integration of transactions and reduction in duplication of data entry (BRAL, 2005; McCausland, 2004). Increasing market revenues for hosted applications are forecast, for example over \$6 billion by 2008 (Clyman, 2004). Bartholomew (2005) also supports this growing trend of using hosted application in SMEs, arguing that large enterprises that have already invested in software, hardware, and staff are less likely to consider hosted applications. Similarly, the Gartner group, cited in Manchester (2005), states that 30 percent of US SMEs will be using some form of hosted application to support their CRM initiatives by 2008. In terms of explaining this predicted increased adoption of online applications by SMEs Chandrasekhar (2005) suggests that increased focus on core competence will be the main factor.

This brief market review indicates that the provision of hosted enterprise applications is increasing, particularly in the US, and that the potential for hosted services is strong. However, accounts of SME experiences of using hosted services are largely anecdotal and often found within the practitioner literature as indicated above. While perceived benefits is one of the main factors influencing the adoption of Internet and EDI in SMEs (Iacovou et al., 1995; Poon and Swatman, 1997), there are other factors such as organisational readiness and owner's attitude towards growth, which need to be considered. Although hosted applications seem to provide a cost effective way for SMEs to selectively outsource (Ward and Peppard 2002) more empirical research on the factors influencing the adoption process and experiences of SMEs using hosted enterprise applications is needed. The next section goes some way towards addressing this shortfall by reporting on recent qualitative research on the experience of SMEs in the UK.

### **Key findings: a user perspective**

The qualitative study explored the use of hosted enterprise applications by selected SMEs in the UK. From this SME user perspective the key findings to emerge from the study include: i) confirmation that ICT infrastructure was no longer a barrier to adoption, ii) the pragmatic approach taken to security issues, iii) the use of both multiple information systems (hosted and resident) and multiple service providers, iv) the financial attractiveness of the rental model and v) the intention to continue or extend their use of hosted applications within the enterprise. Each of these is considered separately below before drawing conclusions.

### **ICT infrastructure was no longer a barrier to adoption**

None of the enterprises encountered any connectivity problems when using hosted enterprise applications. All enterprises had broadband connections with two additionally having lease line connectivity to the service provider. The only negative comment regarding connectivity was from one company which stated 'we are slightly dependent on the phone (lease) line – but this has only gone down once in three years and then only for one hour'. This indicates that for SMEs in the UK the ICT infrastructure was available to enable the use of hosted applications and confirms the findings of the E-Business Watch study (EC, 2005).

### **Pragmatic approach taken to security and confidentiality issues**

There was a general awareness amongst the enterprises of the security and confidentiality issues surrounding the use of hosted applications. Clearly all users had overcome any concerns they may have had in order to access these hosted applications. One company stated that there was an initial reluctance to have data on a third party server but that more functions were being moved to the hosted service. Another company stated they were 'very comfortable with the level of security' of their hosted data but recognised the importance of controlling access levels amongst staff. Interestingly one company had experienced a recent theft of equipment and data which they felt reinforced their decision to use the secure hosted service. Surprisingly, although aware of the importance of security, many users had little knowledge of security and had largely abdicated responsibility to the service providers. Interestingly several highlighted distinct advantages of using hosted applications both in terms of security and back-up. Comments included: 'back-ups are done, it is more secure than we could achieve'; 'the strengths are back-up, security and ongoing developing product'; 'we don't need to worry about the service, back-ups, anti-virus or employ an IT person'. This position is a marked change from only four years ago when security was identified as a major barrier to adoption (DTI, 2000: 6). Overall, there appeared to be high levels of trust from the users to the service providers based on a history of satisfactory to very good service levels. One company characterised their relationship as 'a partnership rather than a traditional supplier-customer model'.

### **Use of both multiple information systems (hosted and resident) and multiple service providers**

No company used *only* the functionality available from the hosted application although most used it as their main information system. The hosted functionality used included: e-commerce, sales order processing, quotations, sales ledger, nominal ledger, purchase order processing, purchase ledger, payroll, e-mail, contact management system, file storage and diary management. In the main these are the conventional horizontal applications but provided on a one-to-many delivery model. Additionally all eight enterprises used resident information systems with several companies singling out the use of financial applications and office productivity tools. Interestingly only two companies were placed under external pressure to use hosted applications and in both these cases it was larger customers encouraging the provision of online ordering systems, and in one case the customer provided financial assistance.

### **Financial attractiveness of the rental model**

All enterprises commented on the benefits of renting applications rather than purchasing software and installing it on their own equipment. Comments included: 'I don't think we would spend a large amount of money in order to bring it in-house'; 'I am comfortable that we are getting reasonable value for money'; 'to pay the money to bring it in-house is not worth it, there are both short and long term savings in using hosted applications. It seems to be better value – we were spending a lot more before'; 'from a financial point of view it is definitely the most cost effective way of outsourcing IT, I think most companies will be happy renting'; 'pricing is not the most sensitive issue - it how fast the functionality can be introduced into the business'; 'hosted applications is a very affordable model – the payback has been virtually instantaneous'; 'we have had a member of staff leave and because of the system we have not replaced them, this saving is greater than the annual rental cost'. Surprisingly very few factors other than cost seemed to influence the adoption decision – one company did acknowledge that the application was 'tried and tested, well established and had useful add-ons'. This does seem to support the research indicating perceived benefits as one of the main factors influencing the adoption (Iacovou et al., 1995; Poon and Swatman, 1997). However, the emergence of cost as a dominant factor is new. Owner's attitude towards growth did not emerge as a theme from the interviews, however, nearly half of the companies were experiencing growth, which was adequately supported or facilitated by the hosted application. Interestingly the lack of organisational readiness as expressed in terms of limited in-house IT expertise was cited by some as a driver to adopt hosted applications.

There is some evidence to support the benefits of using hosted applications as highlighted in the previous market review, namely: flexibility, convenience, access, focusing on core competence, outsourcing provision and back-up, reduction in hardware, software and maintenance costs, integration of transactions and reduction in duplication of data entry are factors in the adoption decision. However these appeared minor when compared to the compelling case for cost reductions so strongly expressed by existing users. Clearly low-cost communications, such as the Internet, has enabled cost effective services to be developed for SMEs by ASPs. The development of this ubiquitous communications infrastructure has been the prerequisite for access to, and adoption of, complex applications by SMEs. There was little evidence that users had developed new ways of doing business as a result of using hosted applications but rather that they had improved existing business practices such as managing customer services, supporting mobile workers and simplifying procedures.

One noticeable exception was the automation of the sales processes by three companies that enables larger customers to place online orders and access sales information directly.

### **Intention to continue or extend their use of hosted applications**

All enterprises stated an intention to continue or extend the use of hosted enterprise applications. Comments included: 'we will probably upgrade and allow the field sales force to have access'; 'I would not change from hosted due to the cost and hassle, I think it will grow'; 'provided there is security hosted systems are a fantastic thing, the cost of maintaining resident systems is the same as the rental costs but you don't have to purchase the software and future upgrades'; 'we are currently only using 25% of the systems capabilities and intend to extend its use when we have time, it is the companies that embrace hosted applications that will grow quickly and this is down the individual business managers'; 'even large businesses will selectively use hosted applications, the future for hosted applications is enormous but the problem is getting to the marketplace'; 'we have not had the time to use all the system yet'; 'we are going to see more appliances accessing the Internet which is the most reliable way of getting information, hosted applications are going to be the thing that enables small organisations to compete with bigger companies but without having the skills and set-up costs'; 'we want to extend the use of the hosted system'. It appears that whilst the adoption decision is primarily cost driven once the hosted application is being used companies focus on maximising the use of the system's functionality. Some companies cited lack of time as a barrier to further usage and acknowledged the need for additional support or training by the service provider. How such support, and related services, could be provided cost effectively by the ASPs was not clear.

The experiences of using hosted applications were overwhelmingly positive. Comments included: 'only minor issues, happy with the level of service'; 'the service levels are fluctuating in terms of support'; 'issues sorted out quickly, back-ups are done, remote access, it has simplified things, I can work from anywhere'; 'it seems to be a lot better, it's a solid system'; 'well structured and easy to use, its simple, manageable, practical and fits our purpose'; 'service is second to none, no complaints at all'. This is in sharp contrast to the negative views expressed about information systems more generally by some of the users, and echoed in the literature of systems failures (Ward and Peppard, 2002; RAE and BCS, 2004). Some users, however, did express concerns. Comments included: 'there is pressure from supplier to upgrade to new interface'; 'there are some restrictions of controls because we use a shared server, it would be a huge upheaval to move to another system'; 'the system is not robust enough, there were problems with a recent upgrade, the information systems are critical to a

Lockett et al

company'; 'we are dependent on the supplier doing a good job as we don't have the technical expertise in-house'; 'the only downside is having 'all our eggs in one basket', the company might go bankrupt'. Despite these fears none of the eight companies contemplated withdrawing from the hosted arrangement.

### **Conclusion**

The brief market review indicates that the provision of hosted enterprise applications is increasing, particularly in the US, and that the potential for hosted services is strong. It is disappointing, therefore, that accounts of SME experiences of using hosted applications are lacking in the academic literature. What available evidence there is largely anecdotal and found within the provider literature, which can be partial. This research in a small way, and in a UK context, provides independent evidence of the benefits that hosted services can bring. For the enterprises that have become users of hosted applications the research indicates that, in the main, they had overwhelmingly positive experiences. By far the most significant driver for users in the decision to adopt was cost – supporting the view that the ASP model appears viable for SMEs. The dominance of this factor was a surprise to the authors given the emphasis on multiple factors identified in the earlier literature. The issue of security, which before this research was thought to be an important barrier to adoption, was shown to be much less significant. ASPs have successfully positioned themselves as 'trusted third parties' to remove this concern. Hence, the research confirms the importance of the role of intermediaries identified earlier by Swan and Newell (1995) and Brown and Lockett (2004). In terms of SMEs decision to adopt, from a strategic perspective, the interviews confirmed that there is no common model of adoption. For some of the firms using hosted applications were a logical next step, for others it represented a discontinuity. In this way the research supports the Levy and Powell (2003) model of non-linear adoption. Indeed for many firms the model of alignment posited by Venkatraman and Henderson (1992) was most relevant. In this model the interaction between the organisational and IT strategies and their respective processes continually interact. A change in one area precipitates changes in others. In this research as the technology was introduced business innovations not previously anticipated, in particular improvements to existing functions, were generated.

From a provider perspective the study presented in this paper appears to endorse the ASP 'one-to-many' provision model for delivering benefits to SMEs at acceptable costs. It is important to note, however, that these services are largely generic. There is evidence in this study that providing additional support cost effectively was problematic for ASPs. This reinforces the importance of both Lockett et al

user and provider perspectives in understanding the behaviour of SMEs. Whether they adopt complex e-business applications, and how they subsequently use them, is influenced not only by their own motives, but by what the provider is willing to do. The latter point signals a contradiction to emerge from this study. Whilst the market review indicates a growth trend in hosted services, and the UK qualitative analysis affirms the benefits to be realised from adopting such services, the fact remains that a large majority of SMEs have not yet done so. This is despite the early predictions that were made for SME adoption of ASP services (ASP News, 2003). The reasons are possibly threefold. Firstly, that they (SMEs) are simply unaware of the availability of such services and of their potential benefits. To help with this some UK policymakers are focusing on increasing the awareness of broadband amongst SMEs and of its benefits (Clyde, 2005; Cumbria, 2005; Lincolnshire, 2005) in the belief that increased broadband adoption will result in the increased use of e-business applications by SMEs - this would appear optimistic given the experience to date. Secondly, even if SMEs are aware it appears plausible that for many of them the step-up from e-mail and Web catalogues to complex e-business applications is perceived to be simply unnecessary, or too difficult. The latter is open to multiple explanations, some of which have been identified in the literature of adoption (Poon and Swatman 1999; Mehrtens et al., 2001; Poon, 2002; Ward and Peppard, 2002; ). And thirdly, the behaviour of the ASPs as providers may be a root cause. Whilst their approach to developing the SME market appears limited, it is rational. They are expanding their activities in the SME sector with generic products, but only in a way which is cost effective. This limits promotional activities, support services and product innovation. All three reasons provide candidates for an extended research agenda into the phenomena of low adoption.

Finally, we recognise that despite the insights from the study that the research is limited. We have looked in detail at a small number of UK companies and it may be that their generally positive experience may not be shared by other countries. The authors would be surprised by this given the evidence of the EC Business Watch Report (EC, 2005). This report is comparative between Europe, Asia and the US and show more similarities than differences. More limiting in this study is the fact that all the SMEs came from only two sources – ASP A and ASP B. Other ASPs could have very different client bases. This would suggest that a larger sample of ASPs would allow the impact of SME size, IT readiness and industry sector to be investigated.

The authors would like to acknowledge the constructive feedback and suggestions of the two reviewers which improved the overall quality of the paper. Additionally they wish to acknowledge the assistance provided by The Research Engine with elements of the data collection ([www.theresearchengine.co.uk](http://www.theresearchengine.co.uk)).

## References

- ASP News (2003) [www.aspnews.com](http://www.aspnews.com), accessed 06 September 2003.
- Bartholomew, D. (2005) 'Hosting Gets Hot', *Industry Week*, 254(3), 67.
- Brown, D.H. and Lockett, N. (2001) 'Engaging SMEs in E-Business: The Role of Intermediaries within eClusters', *Electronic Markets: The International Journal*, 11(1): 52-58.
- Brown, D.H. and Lockett, N. (2004) 'The Potential of Critical Applications for Engaging SMEs in E-Business', *European Journal of Information Systems* 13(1): 21-34.
- BRAL (2005) <http://www.bral.com>, accessed 21 May 2005.
- Chandrasekhar, K. (2005) 'Why SaaS Is Making a Comeback', [http://www.aspnews.com/trends/article.php/11306\\_3492541\\_1](http://www.aspnews.com/trends/article.php/11306_3492541_1), accessed 1 June 2005.
- Company Books (2005) <http://www.companybooks.co.uk>, accessed 21 May 2005.
- Coursey, D. (2004) 'How I run my business with online software', [http://reviews-zdnet.com.com/AnchorDesk/4520-7297\\_16-5124848.html](http://reviews-zdnet.com.com/AnchorDesk/4520-7297_16-5124848.html), accessed 31 May 2005.
- Cragg, P. and King, M. (1993) 'Small-Firm Computing: Motivators and Inhibitors', *MIS Quarterly*, 17(1), 47-60.
- Clyde (2005) Clyde Valley BroadBand Initiative. <http://www.cbbs.co.uk/>, accessed 11 October 2005.
- Clyman, J. (2004) 'Business IT: Rent or Buy?', <http://www.pcmag.com/article2/0,1759,1651062,00.asp>, accessed 1 June 2005.
- Cumbria (2005) Cumbria ICT Broadband Initiative, <http://www.cibi.org.uk/>, accessed 11 October 2005.
- Currie, W., Desai, B. and Khan, N. (2004) 'Customer evaluation of application services provisioning in five vertical sectors', *Journal of Information Technology*, 19 (1) 39-58.
- DTI (2000) *Business into the Information Age: International Benchmarking Study 2000*, Department of Trade and Industry, UK.
- DTI (2004) *Business into the Information Age: International Benchmarking Study 2004*, Department of Trade and Industry, UK.
- EC (2005) <http://www.ebusiness-watch.org/>, accessed 10 March 2005.
- Fillis, I., Johansson, U. and Wagner, B. (2004) 'A qualitative investigation of smaller firm e-business development', *Journal of Small Business and Enterprise Development*, 11(3) 349-361.
- Gillian, C., Graham, S., Levitt, M., McArthur, J., Murray, S., Turner, V., Villars, R. and McCathy Whalen, M. (1999) *The ASPs' Impact on the IT Industry*, IDC Corporation.
- Iacovou, C., Benbasat, I. and Dexter, A. (1995) 'Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology', *MIS Quarterly*, 19 (4) 465-485.

## The Use of Hosted Enterprise Applications by SMEs

Intuit (2005) <http://www.intuit.com>, accessed 18 May 2005.

Jutla, D., Bodorick, P. and Dhaliwal, J. (2002) 'Supporting the e-business readiness of small and medium-sized enterprises: approaches and metrics', *Internet Research*, 12(2) 139–164.

Koh, S. and Maguire, S. (2004) 'Identifying the adoption of e-business and knowledge management within SMEs', *Journal of Small Business and Enterprise Development*, 11(3) 338–348.

Levy, M. and Powell, P. (2003) 'Exploring SME Internet Adoption: Towards a Contingent Model', *Electronic Markets*, 13(2) 173–181.

Lincolnshire (2005) Lincolnshire Broadband Initiative, <http://www.onlincolnshire.net/>, accessed 11 October 2005.

Lockett, N. and Brown, D. (2005) 'An SME Perspective of Vertical Application Service Providers', *International Journal of Enterprise Information Systems*, 1(2) 37–55.

Lockett, N. and Brown, D. (2006a) 'Aggregation and the Role of Trusted Third Parties in SME E-Business Engagement: A Regional Policy Issue', *International Small Business Journal*, 24 (2) forthcoming.

Lockett, N. and Brown, D. (2006b) 'E-Business and the Small Firm' in *Enterprise & Small Business: Principles, Practice & Policy*, 2nd Ed Carter S. and Jones-Evans, D., (eds), Pearson Education, Harlow, UK.

Manchester, P. (2005) CRM adapts to pay-as-you-go, <http://www.insightexec.com/cgi-bin/item.cgi?id=131293>, accessed 1 June 2005.

McCausland, R. (2004) Online Payroll: The Small Firm Connection, *The Practical Accountant*, 37, 4, 36.

Meckel, M., Walters, D., Greenwood, A. and Baugh, P. (2004) 'A taxonomy of e-business adoption and strategies in small and medium sized enterprises', *Strategic Change*, 13(3) 259–269.

Mehrtens, J., Cragg, P. and Mills, M. (2001) 'A model of Internet adoption by SMEs', *Information & Management*, 39(2) 165–176.

NetSuite (2005) <http://www.netsuite.com>, accessed 20 May 2005.

Newell, S., Swan, J. and Galliers, R. (2000) 'A Knowledge focused Perspective on the Diffusion and Adoption of Complex Information Technologies: the BPR example', *Information Systems Journal* 10(3): 239–259.

Noguska (2005) <http://www.noguska.com>, accessed 20 May 2005.

Poon, S. (2000) 'Business environment and internet commerce benefit – a small business perspective', *European Journal of Information Systems*, 9, 72–81.

Poon, S. and Swatman, P. (1997) 'Small business use of the Internet: Findings from Australian case studies', *International Marketing Review*, 14(5) 385–402.

Poon, S. and Swatman, P. (1999) 'An exploratory study of small business Internet commerce issues', *Information & Management*, 35(1) 9–18.

Best Software (2005) <http://www.bestsoftware.com>, accessed 20 May 2005.

RAE and BCS (2004) *The Challenges of Complex IT Projects* Royal Academy of Engineering and The

British Computer Society, UK. April 2004.

Salesforce (2005) <http://www.salesforce.com>, accessed 20 May 2005.

## The Use of Hosted Enterprise Applications by SMEs

Scottish Enterprise (2002) *ASP Development in Scotland: To evaluate ASP development within Scotland*, Parallel56, Glasgow. UK.

Siebel (2005) <http://www.crmondemand.com>, accessed 30 May 2005.

Swan, J. and Newell, S. (1995) 'The Role of Professional Associations in Technology Diffusion', *Organization Studies* 16(5): 847-874.

Venkatraman and Henderson (1992) 'Strategic Alignment: Leveraging information technology for transforming organisations', *IBM Systems Journal*, 32(1) 4-16.

Ward, J. and Peppard, J. (2002) *Strategic Planning for Information Systems*, 3rd edition. John Wiley & Sons, Ltd., West Sussex.

Willcocks, L., Sauer, C. and Associates (2000) *Moving to E-Business*, Routledge, London, UK.

Windrum, P. and Berranger, P. (2002) 'The adoption of e-business technology by SMEs', available from <http://www.merit.unimaas.nl/publications/>.

Yin, R. (2003) *Case Study Research: Design and Methods*, 3rd Edition. Sage Publications, Beverley Hills, CA.