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Relative size and complexity: e-business use in small and medium sized tourism enterprises in Thailand

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Abstract

Purpose – The research documented in this paper aims to explore e-business uses in small and medium-sized tourism enterprises compared with their larger counterparts.

Design/methodology/approach – Five case studies were conducted with Thai tourism SMEs to investigate their technology adoption and use experiences. For large-sized enterprises, an extensive review of industry's practice was conducted. A comparison was then carried out based on the scope of the technology, namely inter-organisation, intra-organisation, and front-end side linking to customers.

Findings – In terms of e-business use, it is not surprising that Thai SMEs remain less advanced in utilising e-business technology. However, size is found to be a significant factor in determining SME behaviour not only in comparison to larger travel agencies or hotels, but also with the SME sector itself. Associated with this is application complexity that is again significant and linked to relative size. Finally, the choices made by small hotels and travel agents are shown to be influenced by the technology providers.

Research limitations/implications – The main research limitation is a limited generalisibility. Future research on SMEs in developing countries would make the comparison more sound and increase generalisability.

Practical implications – SMEs should pay more attention on strategic use of IT in order to compete with their larger competitors. At the policy level, more education on IT development skills and business potentials of IT are needed.

Originality/value – The paper adds to the literature on IT adoption in SMEs particularly with respect to size within the SME sector, the importance of complexity and the role of technology provider.

Keywords Electronic commerce, Small to medium-sized enterprises, Complexity theory, Tourism management, Thailand

Paper type Case study

1. Introduction

The research reported here is part of wider research into the adoption and evaluation of e-business technologies by Thai SMEs in the combined travel and accommodation service sector. In 2006 Thailand generated US$13,780 million from inbound tourism,

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and the travel and accommodation sector accounted for 40 per cent of this revenue (TAT, 2007). The sector is interesting in that large numbers of SMEs are active and the use of e-business technologies is widespread. Of primary interest in this paper are the different experiences of e-business adoption in small and medium-sized tourism enterprises, and the comparison with their larger counterparts. The paper compares the e-business technologies used in Thai tourism SMEs with large-sized travel agents and hotel chains, namely Expedia.com, Asia Web Direct, Ratestogo.com, Accor and BestWestern. This is of significance in two ways. Firstly, the particular issues associated with introducing e-technologies in developing economies are under-represented in the research literature. And, secondly the comparison of e-business use in large and small firms in the same sector can contribute to our understanding of the importance of firm size, particularly size within the SME sector.

The paper is structured into five parts. The first part starts with a consideration of the stakeholders in the travel industry and an understanding of the business models of both the users and the technology providers. There are considerable tensions here as companies of very different sizes are required to both compete and to collaborate. Part two reviews selected prior literature on ICTs adoption in SMEs. In part three the methodology and details of the empirical sample are outlined. Part four discusses the ICT developments within the SMEs and compares these with the practices in established large travel sector firms. Finally, part five discusses the findings and their implications, particularly with respect to size within SME sector.

2. Literature review

The review is in two sections. In the first an introduction to the characteristics and environment of tourism industry is described to provide a context for the travel service sector and its use of ICT. In the second section the review focuses on prior literature for ICT adoption in SMEs. Together these two literatures provide a basis for discussion on e-business technology adoption in tourism SMEs in comparison to their larger counterparts.

2.1 Tourism industry and the e-business technology used in this industry

The tourism industry in Thailand consists of three main sectors: travel and accommodation; leisure facilities and entertainment; and tourism organisations. Our particular interest to this paper is the combined sector of travel and accommodation, which is heavily ICT dependent. This sector, also known as the travel service sector, has a similar structure to conventional retail/wholesale businesses. Stakeholders include suppliers, intermediaries such as wholesalers, retail travel agencies, technology providers and customers or travellers. Tourism products include flight tickets, room reservations, package tour bookings, car hire, cruise tickets, and other related services. Distribution channels can be direct or indirect through intermediaries. Traditionally, the hotels and airlines used wholesalers and travel agencies as their main distribution channels and as the means to access and new and expanding markets. Particularly in the airline industry, the travel agents provided the focus for airline reservations, ticketing, transactions, travel advice, market presence and packaging (Vasudavan and Standing, 1999). Customers or travellers, therefore, continue to make booking with travel agencies, but increasingly customers are booking travel and accommodation directly. The current relationship of each player in the industry is shown in Figure 1.

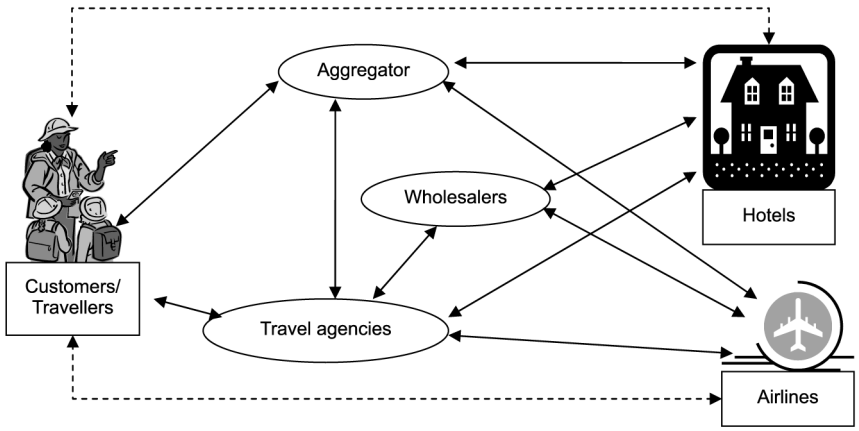

Figure 1.
Relationship among stakeholders of the travel industry

From the relationship map, it can be seen that communications are of paramount importance to the stakeholders, and the internet plays an important role in linking all players together and facilitating communication and information provision for travel trade among them (Pender, 2001). The dotted lines represent the more recent direct links facilitated by the internet potentials. Further details on how each player uses the Internet and e-business technologies to support their business are discussed below.

2.1.1 Suppliers. Suppliers are those who provide products or services for others in the supply chain. In the travel industry, suppliers encompass hotels, airlines, car rental, cruise, and so on. Only hotels and airlines are of particular interest to this paper.

2.1.1.1 Hotels. In the past, hotels relied on travel agencies as their selling channels. Currently, with the internet, hotels can easily provide room information and room availability on their web sites. The huge number of online travellers attracts the hotels, especially the larger-sized hotel chains such as Best Western, Accor, and Ibis. These hotels, which typically have significant IT capability and resources, provide an online booking channel that is fully integrated into their web sites and back-office functions. This delivers more direct customers and yields more margin than reservations made through travel agencies. For local small or medium-sized hotels an online booking system fully integrated into their web sites and back-office functions is normally beyond their resources. They have tended to rely more on travel agencies. Some large-sized travel agencies, however, can provide a means for a small or medium-sized hotel to put its room availabilities for a specified period into their web sites. In this way, customers who search on the internet can find the hotel, check for availability and book for a room through the agents' web sites. Another recent approach is a hosted booking system, which can be easily integrated into a hotel's web site and work as if it is a feature provided by the hotel's site. More about such systems is discussed in technology provider section.

2.1.1.2 Airlines. Airlines were amongst the first adopters of e-business technology (Pender, 2001). The most extensively used e-business application in the airline sector was the computerised reservation system (CRS), which was used to control inventory and to improve accessibility to information within and between partners. CRS operations that book and sell tickets for multiple airlines are known as global distribution systems (GDS). Currently, the four major GDSs are SABRE, Worldspan,

Amadeus, and Galileo (Buhalis, 2004). Each GDS is strong in different market depending on where its parent airlines are operating. SABRE, for example, is strong in the American market, whilst Amadeus is strong in the European market (Starkov, 2001). Each GDS competes vigorously to recruit as many travel agencies as possible to penetrate into broader markets (Buhalis, 2004).

Apart from GDSs, e-business technology can be used to help the airlines develop and manage their business as well as to monitor the external environment and competition. Buhalis highlighted the strategic significance of the ICTs in the contemporary airline industry in a recent paper. The strategic ICTs uses include not only internal operations but also revenue analysis, demand forecasting, branding, and communicating with all stakeholders:

> ICTs play a critical role in the strategic and operational management of airlines. They not only contribute to the formulation of all elements of the marketing mix, but they will also determine the strategic directions, partnerships, and ownership of airlines (Buhalis, 2004, p. 823).

Furthermore, the internet has emphasised the opportunities for cost reduction in the travel service sector (Mazhatul and Suraya, 2005). Airlines, which have long relied on travel agencies as their gateway and distribution channels to customers, have realised that the internet allows greater chances to reach customers directly and to cut the cost of intermediaries. Thus, the airlines are taking advantages from such an open, beneficial channel by launching their online booking system to increase direct bookings and diminish the travel agents' power. Nevertheless, the major limitation of the airlines' own online booking system is that they provide information and options of their own flights only. Many airlines therefore further compete using reward or loyalty programs in order to encourage direct purchasing with the airlines and to obtain repeated customers (Buhalis, 1998; Bennett and Lai, 2005).

Overall, the airlines market is characterised by the larger-sized players. Within a growing market each has competed to gain more customers, with an increasing focus on lowering prices to customers and lowering costs within the distribution channels. The challenge for most airlines is to manage the tensions associated with dual distribution channels that are potentially competitive with each other.

2.1.2 Intermediaries. According to Wynne *et al.* (2002), intermediaries in the travel service sector are those who facilitate the searching process of both the buyers and the sellers by combining and compiling information, which is of interest to both parties in a systematic and comparable form. Importantly, the intermediaries support the efficient and effective exchange process, including issuing tickets and forwarding money, as well as help reduce uncertainty for both parties (Lewis *et al.*, 1998). Major intermediaries in the travel industry are generally either travel agencies or aggregators.

2.1.2.1 Travel agencies. Travel agencies can be usefully divided into wholesalers and retailers. Wholesale agencies typically have a large number of contracts with many suppliers including the big hotel chains (which do not normally contract with small travel agencies) and conduct their business on a B2B model. These agencies resell their inventory to the retail travel agencies. Examples of wholesalers are Gullivers Travel Associates (GTA), Kuoni, etc. The retail travel agencies, however, normally have direct contact with suppliers and/or indirect contact via wholesale agents. Generally, the travel agencies are closest to the travellers and assist them on searching and booking their choices of products or services (Wynne *et al.*, 2002).

Operationally, the e-business technology facilitates the agent's online booking transactions and payments. However, the Internet is exerting an influence on the structure of distribution. The technology profoundly affects the agencies and their strategic position. It helps them provide a more informed service but at the same time empowers the traveller through direct contact with the suppliers (Bennett and Lai, 2005). As the searching and buying transactions are made easier, and travellers become more computer-literate, it is argued that the travel agencies' power on the distribution channels will diminish unless they can offer complimentary advice which satisfies customers' needs. In other words, to prevent the disintermediation of the sector, they have to be more service-based and technologically-oriented in their advisory role (Lewis *et al.*, 1998; Bennett and Lai, 2005).

2.1.2.2 Aggregators. According to Figure 1, the aggregators have come into play as another kind of intermediary. Normally, they specialise in searching the web sites of suppliers and other travel agencies and combine, sort and organise information on the various special deals offered by these web sites. The aggregators do no direct selling. They direct customers to the online agents or suppliers, and charge the latter a referral fee (Beirne, 2005). Examples of well-known aggregators are Cheapflights.com, Kayak.com, and Yahoo! Travel. The emergence of the aggregators has been a significant development.

2.1.3 Technology providers. According to Wyckoff (1997), internet technology not only changes the way these companies conduct their business, but also creates new kinds of intermediary such as providers of electronic payment systems and service for authentication and certification of transactions. In the online travel industry, this kind of intermediary includes the e-payment providers, the application service providers, which provide (mostly web-based) booking system for travel agencies, wholesalers and suppliers. The GDS provider can also be classified as a technology provider. Typically, these service providers do not link directly to the travellers, but they support the suppliers and/or travel agencies' business activities. The revenue model of these providers is varied, depending on the application/service they provided, and how they contract with their customers (e.g. hotels, airlines, travel agencies). Tariffs are typically based on combinations of transactions and service rentals. Examples of the technology providers are hosted hotel booking systems, Pelican and Pegasus[1].

Overall, it has been long argued that tourism is an extremely information-intensive industry (Poon, 1993). The internet has opened up new opportunities for all players in the industry to present themselves, offer their products online, and improve many of their business activities. The competition between suppliers and travel agencies has thus inevitably increased. They have to be better able in offering distinctive value to their customers, based on a well-defined and robust business model. Obviously, the expertise on the internet and e-business technology, if used properly, can be of great help in achieving this goal. Nevertheless, it is the case that most benefits and impacts of e-business use as discussed above are reported in the context of larger-sized enterprises in the industry. Hence, although the internet can help the small travel agencies to be able to expand their market worldwide and to run 24-7 type stores, they remain disadvantaged in such a highly information-based market. They usually lack technology expertise and cannot offer the complex, full-option price comparison system that large travel agencies like Expedia, e-bookers, etc. provide. The next section explores this further through a review of the prior literature on ICTs adoption in SMEs.

2.2 SMEs and ICTs adoption

Early research on the internet adoption in SMEs focuses primarily on factors that affect the Internet adoption decision. One of the most often cited papers is that of Mehrtens *et al.* (2001). Attempting to study a model of internet adoption by SMEs, the authors adopted the study of EDI adoption in SMEs by Iacovou *et al.* (1995), indicating that perceived benefits, organisational readiness, and external pressure are major factors which influence the EDI adoption. Mehrtens *et al.* (2001) found that these three factors are also applicable in the case of internet adoption. Perceived benefit is also considered a driver of internet adoption in the study by Poon and Swatman (1997). Other supporting 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), location (Windrum and Berranger, 2002), application complexity (Brown and Lockett, 2004), and the provider perspective (Brown and Lockett, 2004).

Table I groups the factors into three contexts – technology, organisation and external environment – and links these to the individual factors (Tornatzky and Fleischer, 1990). Overall, less attention has been paid by researchers to the technology context, although Wolfe (1994) and Tornatzky and Fleischer (1990) have pointed out its importance to the study of the diffusion and adoption process of an innovation. Similarly, in the external environment Brown and Lockett (2004) point out that application complexity is the absent factor in most of the current theories of adoption.

In general, it can be seen from Table I that the research on factors influencing IT adoption yields coherent results. However, there are differences. For example, while Riemenschneider *et al.* (2003) and Brown and Lockett (2004) found technology complexity one of the factors significantly influencing adoption, Grandon and Pearson (2004) found complexity an insignificant factor, but confirmed organisational readiness as a significantly influential factor. In contrast, Mirchandani and Motwani (2001) reported organisational readiness as insignificantly influencing adoption. Al-Qirim (2006), and especially Parker and Castleman (2007), also highlight inconsistencies. Parker and Castleman (2007) examined the reasons underlying such differences and concluded that prior research in this area had tended to treat SMEs and e-business applications homogeneously rather than as diverse and complex entities. Furthermore, the majority of existing research adopted of the perspective of the SMEs themselves without considering the impact of complex relationship that the SMEs may have with friends, family, other businesses and technology providers.

Regarding to the issues of limited generalisability Burke (2005) and Levenburg (2005), who focused on the impact of firm size on internet use and e-supply chain use respectively, agreed that a more variety of size groupings will be helpful in treating and understanding the heterogeneity of the SMEs. Specific to Thai SMEs, Lertwongsatien and Wongpinunwatana (2003) identified firm size as one of the influential factors on e-commerce adoption decision in the sampled Thai SMEs. Similarly, Khemthong and Roberts (2006), who studied adoption of internet and web-based marketing tools in Thai Hotels, also confirmed the importance of firm size and pointed out that larger hotels were more ready for the adoption and adopted the Internet technologies earlier than the smaller hotels. This study, however, sampled all hotels rather than the smaller (SME) hotels. Additionally, both studies were survey

Context	Adoption factors	Authors
Technology	Perceived compatibility	Tornatzky and Fleischer (1990) (mention as a part of technology characteristic) Lertwongsatien and Wongpinunwattana (2003) Grandon and Pearson (2004) Khemthong and Roberts (2006)
	Perceived benefits/values	Poon and Swatman (1997, 1999) Iacovou *et al.* (1995) Mehrtens *et al.* (2001) Lertwongsatien and Wongpinunwattana (2003) Grandon and Pearson (2004) Wymer and Regan (2005) Al-Qirim (2006) Chong (2006) Gemino *et al.* (2006)
	Technology knowledge/understanding	MacGregor and Vrazalic (2005) Martin (2005) Khemthong and Roberts (2006)
	Application complexity	Riemenscheider *et al.* (2003) Brown and Lockett (2004)
Organisation	Firm size	Tornatzky and Fleischer (1990) Windrum and Berranger (2002) Lertwongsatien and Wongpinunwattana (2003) Burke (2005) Levy *et al.* (2005) Levenburg (2005) Khemthong and Roberts (2006)
	Owner-manger/CEO	Cragg and King (1993) Poon and Swatman (1999) Fillis *et al.* (2004) Martin (2005) Al-Qirim (2006)
	Formal/informal linking structure	Tornatzky and Fleischer (1990) Rogers (2003)
	Strategic intent	Levy *et al.* (2005) Levenburg *et al.* (2006)
	Innovation	Brown and Lockett (2007)
External environment	Business sector/characteristic	Tornatzky and Fleischer (1990) Poon and Swatman (1999) Windrum and Berranger (2002) Fillis *et al.* (2004) Levenburg *et al.* (2006)
	External pressure/competitiveness	Tornatzky and Fleischer (1990) Iacovou *et al.* (1995) Mehrtens *et al.* (2001) Lertwongsatien and Wongpinunwattana (2003) Grandon and Pearson (2004) Wymer and Regan (2005) Al-Qirim (2006) Chong (2006)
	Technology provider	Brown and Lockett (2004) Lockett *et al.* (2006)

Table I.
Major factors influencing ICT adoption and use

based and treated adoption as an "event", rather than process involving intermediaries such as aggregators.

In summary, the industry review provides a basic understanding of the large players and their relationships as well as information technologies they use, whilst the review of literature on e-business adoption in SMEs considers factors influencing IT adoption in SMEs. The issue of heterogeneity of SMEs is taken as a primary concern here. In relation to firm size the above review suggests that a finer grained understanding of firm size within SMEs is needed. Additionally, to complement the large body of survey-based adoption research, there is a requirement for work that is capable of explaining firm actions from an understanding of individual firm contexts both internal and external. Through the adoption of a case based approach the paper seeks to contributes to this aim.

3. Research methodology

This paper draws on wider ongoing research focusing on investigating e-business adoption and evaluation in Thai small or medium-sized tourism enterprises. In the research, five SMEs (three tourist agencies (TA) and two hotels (H)) were selected based primarily on accessibility (since they had to be willing to commit considerable time to on-site discussions etc), their size and their e-business use. SMEs were selected that had committed to using internet technology beyond simple e-mail and a static web site, which are ubiquitous. This would allow a richer discussion on the experience of using the technology and its evaluation. In this paper the adoption decision and experience of technology in use by the subject SMEs are compared among themselves, as well as with their larger-sized counterparts, to provide further insights into the impact of size and the realities of ICT adoption.

In respect of the larger-sized travel agents and hotels, their e-business technologies and applications were collected using extensive secondary data and used for comparison and as context for the SMEs. The large companies were selected on the basis of the availability, accessibility and reliability of their secondary data but also took into account the views of the SMEs, who knew of, or had direct experience of, these larger firms. Eventually, Expedia.com, Asia Web Direct, and Ratestogo.com were selected as the large-sized travel agent examples, and BestWestern and Accor were selected for the large-sized hotels. All these companies, except Expedia.com, were resident in Thailand.

Secondary data were collected from the companies' web site, online travel industry forums (i.e. hotel-online.com, hotelsmag.com, etc.) and from case materials produced by technology providers (e.g. Microsoft.com) (ElementK.com, 2007). These were collected and analysed to see what technologies the companies had adopted and used to enhance their online business. Wherever possible multiple secondary sources were used to cross check data. The individual in-company adoption decisions, however, were not included because of access difficulties and because the adoption processes for these very large firms was outside the scope of the main research. Comparison of ICT between SMEs, and their large-sized counterparts, thus focused on the technology in use, rather than adoption.

In the case of the SMEs the sample was split into two. In the travel agencies' sub-sector the majority of firms are SMEs when defined by the standard convention of employees (i.e. less than 250 employees) (SBS, 2003). Here three firms were selected one each in the micro (0-9), small (10-49) and medium (50-99) sub sectors of the SME sector.

In the hotels' sub-sector, the definition and classification of Thai "hotels" is problematic. Very small establishments are classified as "guest houses", "motels", or "inns", rather than hotels. The majority of Thai establishments that are typically officially licensed as hotels are 100 rooms or more, and have staff complements that define them as large SMEs, or simply large firms (i.e. over 250 employees). The two selected hotels in the sample are large SMEs that are private family owned hotels.

From the literature review, the summary of major factors influencing IT adoption in SMEs (Table I) was used as a lens to investigate the five selected SMEs to see how each factor plays a role in each of these SMEs. Semi-structured interviews were conducted with owner-managers or managers who were responsible for IT adoption. The questions were open-ended, aimed to elicit the interviewees to discuss factors, both internal and external, influencing their e-business technology adoptions. The technology and business issues were also discussed to learn about their use experience including how the technology has been used to support or enable their business. Overall, the cases are detailed with over 20 hours of interview access in each SME.

The sample characteristics are summarised in Table II.

4. Comparisons between SMEs and large firms

In this section, the factors found influencing ICT adoption in the selected SMEs are discussed first in 4.1 using the classification of factors outlined in Table I. This is followed by a discussion of ICT usage in the SME travel agencies and hotels (4.2 and 4.3 respectively), with reference to their larger counter-parts.

4.1 Adoption by SMEs

In discussions the two hotels emphasised the primacy of environmental factors in their decision to adopt internet based technologies reflecting the trend for online booking by agents and by customers. The need for intensive and timely information by customers also reinforced this trend. The clear conclusion from the hotels was that the travel agencies had been the most influential in shaping their ICT policies. In turn, for the travel agencies the adoption, particularly of the GDS, was forced predominantly by the industry-wide supplier systems. The agents needed the GDS in order to check availability and flight schedule and also to issue flight tickets. These unequivocal observations that for SMEs in the travel service sector industry-specific factors are the major influence on e-business adoptions is interesting, but may not hold in other industries. This is revisited later in section 5.

Technological factors were second in importance to environmental factors according to all the SMEs. In this category perceived benefits of the technology were highlighted as their main concern. Benefits, provided they were clearly identified and particularly matched their business goals, which were typically related to growth, positively influenced the adoption decision in all five cases. Application complexity was also found to be a major issue in the two hotels (H1 and H2) and the smallest travel agent (TA1). These three SMEs felt they lacked adequate ICT capability and financial resources to develop or oversee the new technologies. They were totally dependent on the technology providers who supplied application services and support on a rental or commission model for the advanced applications such as billing or integration into other agencies room inventories. Without this support it is likely that these SMEs would not have progressed beyond e-mail and static web sites. The two other larger travel

Company	Business	Customer	Ownership	Number of employees	Turnover	Information technology
TA1	Travel agent, focusing on flight ticketing	Individual customers within Thailand	Family owned/owner-manager	5	£100K	AMADEUS E-mail Internet Web site A link (on the web site) to an affiliated online hotel booking system provided by a large-sized travel agent
TA2	Travel agent, focusing on flight ticketing	Corporate customers within Thailand	Family owned/owner-manager	25	£350K	AMADEUS E-mail Internet Web site Online booking system provided by a large-sized travel agent (but did not integrate to company's web site) Internally developed online booking system
TA3	Travel agent, focusing on hotel booking	Large market based of individual online customers from around the world	Entrepreneur owned/professional management team	80	£6.8M	Online, internal back-end system Web site with e-commerce feature and instant confirmation feature Online marketing tools AMADEUS
H1	Hotel	Individual customers from anywhere	Family owned/professional management team	150	£2M	Pelican system Online booking systems provided by large-sized travel agent
H2	Hotel	Individual customers from anywhere	Family owned/professional management team	150	£1.5M	Pelican system Online booking systems provided by large-sized travel agent

Table II.
Case characteristics

agencies also used application services but their level of dependency was less and their discussions with providers were more informed. This led to higher levels of customisation and additional functionality.

Finally, in relation to organisational factors the SMEs did not consider their size an absolute barrier or facilitator of their adoption decision. Indirectly, however, the smaller firms were conscious of their lack of financial or technical resources and this affected their thinking significantly as described above. In contrast the owner's or manager's enthusiasm in using ICT was evidenced across all cases as one of the important drivers of IT adoption. This observation is closely linked to their perception of business benefit. The two larger agencies TA2 and TA3 specifically identified the need to strengthen their online position as the rationale for their interest in adopting more complex e-business technologies as well as in using them more efficiently.

4.2 E-business use in travel agents

The three small or medium-sized travel agents started with e-mail and web site. In the two small-sized agents (TA1 and TA2), their web site was initially static. While TA1 chose to adopt the hosted web development solution due to its limited IT capability and resources TA2, which had greater financial resources and IT knowledge than TA1, developed the web site internally. Later, as industry and customer practices increasingly moved to an internet basis, they attempted to adopt more interactive feature such as an online booking form (with the help of the provider in TA1 and internally developed in TA2). However, they were still reluctant to implement full e-commerce features such as on-line payments, as they still did not judge the demand from their customers to warrant investment. This was true, for example, of TA2 which although understanding the future importance of a full on-line presence held back from making the commitment. In contrast, the medium-sized agent (TA3) started with an e-business model; the web site was thus more interactive and provided online booking features, including electronic payments. Additionally, the ability to issue flight tickets directly was considered important, and hence the adoption of GDS was vital. All agents used the GDS to obtain key information (route, flight schedule, availability, etc.), make instant bookings and issue tickets. For their marketing, the two small-sized agents, which focused more on local customers, did not utilise online advertising unless the cost was very low. They preferred using traditional media such as print. The medium-sized agent (TA3), however, relied considerably on online marketing media to reach worldwide customers and penetrate into new markets. For all three of the travel agents it can be seen that to differing degrees the e-business technology adoption was more for the front-end activities - accessing customers and then engaging with them to provide and deliver products/services.

For back-end services, only TA3 was using web-based applications. These had been developed internally, to facilitate and link operational activities together. The application and its database system is now the backbone of the company and is used extensively by both staffs and management. One of the smaller sized agents (TA2) is now beginning to move on this direction. The company is gradually building up its IT capability and is developing the web-based information system to support its back-end activities. It is only the smallest agency TA1 which does not have a plan to grow bigger and to develop integrated IT applications to support the business. Partially this

is because there is only a few staff, including the owner-manager, working on the booking and responding to customers.

Turning to the larger travel agents such as Expedia we expected differences but the extent of these differences was of interest to us. In particular whether these differences were scale or functionally driven. In all three of these agents we found a high degree of front and back-end integration with notable differences at the back-end. For example in Expedia advanced back-end systems includes a "business intelligence system". Based on data warehouse technology the system routinely tracks sales trends, manages financial data and integrates with the ledgers, generate exception reports, and processes price variation rules for impact on operating costs (Microsoft.com, 2003). For inter-organisation applications, Expedia, Asia Web Direct, and Ratestogo.com all provide an administration page on their web site for hotels to login and input hotels' information as well as room availabilities and rates for specific periods.

At the front end of the larger-sized travel agents' basic functionality – travel and hotel bookings – remains the same but the degree of sophistication is much greater. For example their search engines can explore many combinations of travel, accommodation and related services quickly and then create dynamic packages from the huge number of available flights and hotels, which requires powerful data base systems and advanced search engines, with expert functionality. These systems also provide real-time confirmation with "instant" e-mail confirmations to customers on completion of the transaction. To achieve this, their search engines are directly linked to GDS, which is expensive. For corporate customers, Expedia goes further by providing them with an online corporate travel management tool, which offers searching criteria and provides electronic bills and reports customised according to companies' needs. Furthermore, Expedia can also help its corporate customers integrating their SAP or other e-procurement platforms or expense management tools to its corporate travel system, allowing the seamless purchasing processes (Expediacorporate.co.uk, 2004).

In comparative terms the technology adoption gap between large and the smaller SME travel agents is very significant. It is not simply more and better integrated technology to meet the demands of greater volumes of customers and transactions, but is manifested in the sophisticated functionality available to all three large agents. In strategy terms the available technology to the large agents has driven their business strategy such that the emphasis is on leveraging the internet technology to integrate with suppliers, including hotels, airlines and local small or medium-sized travel agents. The more "convenience" the agent can provide for its suppliers, the more likely it can enlarge its variety of products, meaning more chances to sell. In the main, it can be argued that the large-sized travel agents examined here focus their technology investment on relationship management with suppliers and selling products to travellers. For the small or medium-sized travel agents their focus has become one of selling to travellers. The B2B solutions emphasised by the larger agents are considered too complex, expensive, and risky to these small or medium-sized travel agents.

4.3 E-business use in hotels

The two medium-sized hotels (H1 and H2) in this research, although located in different provinces, had similar customer targets, which were usually European tourists, and thus had similar strategies to use the internet to acquire more customers. Their main

strategy is to minimise the risk of non-occupancy through multiple booking channels. In technology terms this happened for these hotels in two main ways. Firstly, the ability for travellers to book directly with them from the web page and receive instant confirmation of their booking. This provided the hotels with the best room rates. The "Pelican" is a web based proprietary system that both hotels used and is available from a specialist technology provider. Secondly, the ability to take bookings from specialist booking agents on behalf of customers. In this case the agents were typically the large agents who not only provided the bookings but also the web-based systems that underpinned these transactions. These systems allow the hotels to place their inventory on the agent's database and to have their hotel information and room availability appear online on the agents' web site. Examples of such booking services used by the hotels are Latestays.com, Ratestogo.com, Hostelbookers.com, etc. These agents provide the hotels with another alternative for promoting their hotel online with little effort and realistic costs; while the agents, who usually have IT and online marketing expertise, generate commission fee from each booking confirmation. Clearly, it can be seen that the hotels relied on travel agents and technology providers in terms of internet applications to reach customers.

The larger counterparts of the small and medium-sized hotels are the larger hotels that are usually part of a big hotel chain, such as BestWestern and Accor. These large size hotels are in a far better position in terms of IT capability and financial resources and thus exploit the internet and e-business technologies substantially both front and back end to manage their inventories and market their products and services. Intra-organisationally, having many sister hotels and partners, the large hotel chains need to have a system which links internal data, particularly room availabilities and rates of each hotel from its property management system, to a central reservation system and to the main web sites of the brand. Both hotel chains have also implemented e-learning systems. Through these systems the hotels save on travelling costs for training trips and also facilitate standardised knowledge formats to allow easy access all partner hotels. Inter-organisationally, the large hotel chains develop interfaces which link their central reservation systems to the main GDSs, which are used mainly for flight booking but can also be used for booking hotels, car rentals and cruise trips (Hotel-online.com, 2005; Realmedia.com, 2007). Such integration requires an advanced IT knowledge and can incur high costs in hiring professional IT expertise. For their customers, the large-sized hotels not only use their web site extensively to approach customers but attempts have also been made to implement IT tools to promote their rooms. Customer relationship management is another area where the large hotels can apply the Internet technology better and more advanced than small and medium-sized hotels can do. An example is BestWestern's "'Knock'Knock®", a desktop application, which links via the internet and receives alerts about new special offers of various hotels of the BestWestern chain, direct to customers (BestWestern.com, 2007). Finally, loyalty programs offered by the large-sized hotels can be accessed via the internet, whilst the two medium-sized hotels showed little interest in utilising a customer database.

As with the travel agents the difference in their use and adoption of internet technologies between the large and the SME hotels was considerable. In contrast to the SME travel agents neither of the hotels, which were medium-sized, attempted any development or customisation of the applications. In house IT resources were simply

not a consideration. Typically SME hotels are much more likely to meet their internet needs exclusively from the industry providers and there are many alternatives. Much of this can be explained by the different industry structures. On the travel side, particularly air travel, the reservations are mainly controlled through four proprietary global systems. This has two effects. Firstly, the barriers to entry for other reservation providers are formidable and the intra-industry relationships are relatively stable. Secondly, and deriving from this stability, is that incentives to innovate by the main providers is low leading to innovation taking place within the travel agents. On the hotel side there is no equivalent domination by accommodation system providers. Barriers to entry are lower, and incentives to innovate are higher as a means to gain hotel customers. Effectively the responsibility for innovation lies with the providers.

5. Discussion, some conclusions and future research

This research set out to learn more about the adoption and use of e-business technology within SMEs in the tourism industry and how and why this differs from its use in large-sized enterprises in the same industry. Of emerging interest to the authors was the difference within different sized SMEs and the significance of application complexity. Given the research goal the findings appear helpful and are discussed below.

5.1 Large-sized firms and SMEs

As expected the research highlights significant differences in technology adoption and use between the two groups of firms arising largely from their respective sizes and available resources. In this the authors support the relationship between firm size and the adoption of more complex and more advanced e-business technologies (Levy *et al.*, 2005; Brown and Lockett, 2004). In the case of the large travel agents such as Expedia this resource advantage manifests itself in the sophistication, innovation and integration of applications, particularly the back-office applications and analytics. For the reasons stated in section 4.2 this innovation originates within the large travel agent firms rather than the providers, and explains some of the variations between large firms. Similarly, the small and medium-sized travel agents tend rely on internal innovation but in contrast are resource poor, and hence it is more difficult. Indeed, it is not uncommon for the smaller TAs to reject innovation offered by the large-sized providers because of their complexity and cost. Overall, technology led innovation is perceived to be risky and caution prevails – a point emphasised by Levy *et al.* (2005). In the case of the hotels again the differences between large and small firms are evidenced in the sophistication of their applications but the differences are not as exaggerated. The widespread availability of hotel applications from multiple providers incentivises the providers to differentiate through innovative features. This mitigates the resource limitations for small hotels. This observation reinforces the importance of innovation location and the role of providers, frequently application service providers (ASPs), for SMEs (Brown and Lockett, 2007). This provider perspective is absent in much of the adoption literature, for example in the influential technology acceptance model (Davies, 1989; Wixom and Todd, 2005).

Although large-sized enterprises serving the Thai tourism industry are more advanced in their technologies and more diversified in their products and markets, it remains the case that through appropriate adoption of internet technologies SMEs can grow and compete. The five cases demonstrate that the SMEs although restricted by

their limited resources, have adopted technologies with similar concepts, albeit less advanced and more restricted in functional capabilities, than their larger counterparts. Indeed as discussed above technology providers can play an important role in helping the SMEs to be able to compete with their larger counterparts, particularly in small or medium-sized hotels where IT development is not a core capability.

Finally, a network of partners and customers is another important factor in this industry in terms of the potential and capability to offer attractive online loyalty programs and a wider range of products and services, including those made available by IT. Although it seems that the firm size and the size of partnership network are beneficial in this industry, the market sensitivity of price and service quality helps reduce the gap between SMEs and their larger counterparts. In the five SME cases there was clear evidence of the firms targeting individual customer bookings where close customer relationships and quality service could be established. This countered to some extent the technology advantages enjoyed by the large-firms. Nevertheless it remains the case that the more technologically perceptive larger agents have a better chance to succeed, whilst leaving behind the small companies which are less technologically capable – a point made by Elliott and Boshoff (2005).

5.2 Size within SMEs

The findings from all of the SME cases in this research appear to reconfirm strongly those of Iacovou *et al.* (1995), Mehrtens *et al.* (2001), Poon and Swatman (1999) and Windrum and Berranger (2002) that external factors (e.g. business environment, customers, competitors) are the main drivers of IT adoption by the SMEs. But the research adds to previous work in two ways. Firstly, in the above studies relative size between SMEs was not a variable. In this work relative size was a factor and the findings suggest that irrespective of size the external environment is highly significant in ICT adoption. However, the cases also illustrate that in response to the environment actual ICT implementations by SMEs are highly variable in terms of the complexity of the applications adopted. This is significant as much previous work conceptualises ICT adoption as an "event" or "on-off" decision. The second observation on the importance of externalities relates to industry specificity. All five SMEs in the travel service sector cited the externalities as the major factor in technology adoption. This is perhaps not surprising since internet technology has become ubiquitous in the business practices and strategy of this sector. This behaviour echoes Spender's (1989) strategic concept of industry recipes – the idea that industry behaviours are driven by a collective set of norms. This observation underlines the likely importance of industry specific externalities. But, it cannot be assumed that this holds in all situations. For example, Kaynak *et al.* (2005), who investigated factors affecting e-commerce adoption decisions in manufacturing SMEs, did not find this link.

The interpretation of the SME cases in terms of the technological and organisational factors is less clear-cut. One of the frequent simplifications in SME based research is to treat the sector as homogeneous and this can be highly misleading (Parker and Castleman, 2007). In this research the differences between SMEs was as significant as between large-firms and SMEs. For the SME travel agents turnover varied between £100k and five employees (a micro firm TA1) and £6.8m and 80 employees (a medium firm TA3). In this situation the relative size of the small firm impacted on their capability and willingness to invest in the new internet technologies, and the

associated risk. The medium sized travel agent (TA3) started its internet technology strategy with an e-business model in mind similar to its larger counterparts albeit at a less sophisticated level, i.e. a web-based back office system, online confirmation for bookings, and e-commerce features on the web site. The situation in the micro firm (TA1) was very different. Here change was extremely cautious and incremental and this remains the mindset relating to the firm's future possible changes. Small travel agent (TA2) with 25 employees uses similar technology to TA1 but is contemplating strengthening its online presence in the future.

The above case data provides strong support for the concept that relative size between small firms is very significant in IT adoption. This mirrors Levenburg (2005) comments on differences between large and small firms generally. Size, however, is not a complete explanation of the differences between the internet adoption strategies of the five cases. In small firms the importance of the owner's enthusiasm is well understood (Cragg and King, 1993). This was the case here but there were other influences beyond the owner including family and professional management. Together with other factors these constituted the receptivity environment within the firms for major organisation change (Pettigrew and Whipp, 1991; Pettigrew *et al.*, 1992).

A discussion of the implications for theory and practice of the two cases above, and a potential future research agenda, is introduced below.

5.3 Limitations and future research

There are four factors that affect the generalisation of this research. Firstly, although the two hotel cases and the three travel agent cases are within the same sector the number of cases is still modest. Secondly, the comparison was conducted between SMEs and their larger counterparts using different types of data – the case data was richer. Thirdly, the research on the SMEs cases was conducted in a Thai developing country context. Although the internet has blurred the geographical boundaries, and the tourism industry is global, some contextual differences still remain relevant. Education and IT skills, for examples, are quite low in Thailand compared with in European countries. And finally, the tourism industry, particularly airlines, is among the leaders in technology adoption. Hence, the findings about the internet and e-business adoption in firms in this industry might yield a relatively more positive result than findings from other industries

Despite these concerns the twin criteria of "literal replication" and "theoretical replication" is met to a significant extent in these cases (Yin, 2003). The insights are helpful and the findings add to our understanding of internet adoption, particularly in respect of firm size, application complexity and the role of technology providers. The implications for practice and theory are significant. For practice the research underlines the problems that small firms have in adopting advanced technologies – an issue of special concern in developing economies with their economic dependence on SMEs. It suggests that a policy response by the Thai government aimed at increasing IT adoption could be appropriate (a wider consideration of the role of IT policies is given in a recent UN report (UNEDO, 2006)). At the theory level this research highlights the need for further work into the significance of relative size between SMEs and IT adoption, and into the role of providers within particular industry settings. Current research on small firm IT adoption largely ignores institutional arrangements and in particular the interactions between large and small firms and technology

providers. Finally, this research agrees with the study of Parker and Castleman (2007) that more research, which focuses on understanding each SME case within its specific and perhaps distinct contexts, is needed. The case studies reported here serve as an attempt to treat SMEs heterogeneously.

Note

1. These two providers develop an online hotel booking system and host it on their server. Hotels can simply link their web site to this online booking system and create and manage their inventory in the system through an administrative web pages provided by the providers.

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