B2B services: IT adoption in travel agency supply chains

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Abstract
Purpose – The purpose of this paper is to examine and test a model which integrates the antecedents and consequences of adopting information technology (IT) with suppliers (i.e. online communication and e-procurement) in the context of the travel agency supply chain.
Design/methodology/approach – A mail survey was conducted among 101 managers of travel agencies. A structured questionnaire was developed to measure the informants' scores on a set of the model constructs (i.e. IT adoption, B2B interactions, environmental factors, sales performance, efficiency, and relationship development).
Findings – The findings confirm the influence of e-communication on e-procurement in supply chains. Regarding the antecedents, relationship intensity and environmental factors partially enhance the e-business adoption. The impacts of IT adoption on supply relationships are also supported.
Research limitations/implications – Even though this study is cross-sectional, it may be interesting to develop a longitudinal study to understand the evolution of this phenomenon.
Practical implications – IT adoption requires an integrative approach in supply chain relationships. The adoption of IT needs to be taken into account by any service business, given its positive effects on the sales growth, cost reduction and favourable long-term B2B relationships.
Originality/value – The primary objective of the paper is to provide some new perspectives in explaining how IT can enhance service firms' productivity and ensuring long-term B2B relationships. Interestingly, while previous studies in manufacturing companies have provided theoretical clues to analyze antecedents and outcomes of e-business, no previous study has been applied in services supply chains.

Keywords Communication technologies, Supply chain management, Travel

Paper type Research paper

An executive summary for managers and executive readers can be found at the end of this article.

Introduction

The supply chain management philosophy emphasizes supply chain integration that links a firm with its customers, suppliers and other channel members (Eng, 2006). The use of information technology (IT) in managing the supply chain process has drawn increasing attention in the corporate and academic world (Mentzer, 2004). Indeed, the low-tech supply chain started to die out in the 1980s and was almost extinct by the mid-1990s (Levy and Grewal, 2000). Recently scholars agree that internet and other emerging technologies are playing an important role on the supply chains (Lancioni *et al.*, 2000; Leek *et al.*, 2003). Even though this interest, there is a growing acknowledgment that empirical research is required in the study of antecedents and consequences of IT adoption in supply chain relationships (Croom, 2005).

Despite recognizing the importance of IT in service organizations (Glazer, 1999), especially for industries such as travel and tourism, with a high level of intangibility (Laroche *et al.*, 2005) and the need of intensive product/service knowledge (Christiaanse and Venkatraman, 2002; Lee *et al.*, 2005), there are few empirical studies focused on IT adoption in B2B services' supply chains. For example, previous studies on the impact of e-commerce on supply chains are conceptual (Roy *et al.*, 2004) or, basically, they use exploratory research (e.g., Lancioni *et al.*, 2000; Golicic *et al.*, 2002).

This paper aims to contribute in this area and, in particular, with an application to the adoption of IT in travel agencies' supply chains. The objectives of this research are to:

- analyze the levels of IT adoption in a supply chain;
- assess the influence of B2B interactions and environmental factors on IT adoption; and
- examine the implications of IT adoption for business performance, including sales performance, efficiency, and relationship development.

Being part of the service sector, the travel and tourism industry has inevitably been associated with developments in new technologies (i.e. computer reservation systems, global reservation systems, and the internet). Although some researchers argue that the diffusion of IT leads to a process of disintermediation (e.g. Buhalis, 1998), the adoption of IT provides significant opportunities for tourism intermediaries (Stamboulis and Skayannis, 2003). Specifically, the ability of a travel agency to build and sustain relationships with its suppliers and customers, together with the adoption of IT in order to upgrade its distinctive competencies (i.e. intelligence-

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based intermediaries to meet customers' interests) support the importance of analyzing IT in travel agency' supply chain relationships.

The structure of this paper is organized as follows. We begin with a review of the use of IT in supply chains, particularly, in the service setting. Building on previous research on e-business (Wu *et al.*, 2003), we develop a framework describing two levels of e-business adoption (e-communication with suppliers and e-procurement), and the antecedents and outcomes of e-business adoption. The hypotheses derived from this framework are tested using a quantitative study in retail travel agencies. We then describe our data collection and construct development procedures. Subsequently, we present our results. We conclude our paper with a discussion of our findings and their practical implications.

Conceptual background

IT adoption in supply chain relationships

Supply chain management (SCM) is a business term that has emerged at the ending of the 1990s (Ballou *et al.*, 2000). With this term and its application come opportunities associated with managing the logistics channels across the boundaries of businesses, such as between firms and their suppliers. Much of the research in SCM has focused on the supply chains for manufactured goods (Lancioni *et al.*, 2000). To date, little work has been done in creating a comprehensive framework for understanding and managing the services' supply chain, from the standpoint of either a provider of services or a buyer of services. However, it is believed that service businesses can benefit by applying some best practices from manufacturing to their processes (Ellram *et al.*, 2004; Kathawala and Abdou, 2003). For instance, focusing on manufacturing goods, Lancioni *et al.* (2003) highlight the role of internet on SCM. While the internet provides a low-cost network for business-to-business (B2B) commerce transactions, the benefits of the internet go far beyond cost reduction. IT adoption in SCM leads to more strategic partnering and greater reliance on time-based strategies, along with more transparent logistics organizational structures, and increased emphasis on performance measurement (Bowersox and Daugherty, 1995). The integration of IT at all levels of business practice leads to the concept of e-business as explained below.

E-business can be defined as "the use of electronic networks and associated technology to enable, improve, enhance, transform or invent a business process or business system to create superior value for current or potential customers" (Sawhney and Zabin, 2001, p. 15). As such, e-business offers fundamentally new ways of doing business, as opposed to mere extensions of existing practices (Webb, 2002). By helping to build and manage relationships with customers and suppliers, e-business has an ubiquitous impact across the firm' supply chain (Wu *et al.*, 2003). Participants in the supply chain can use e-business to enhance value at all stages by allowing increased customization in materials and processes to meet the overall needs of the supply chain network, including end user (Lancioni *et al.*, 2003).

From a supply chain perspective, e-business adoption has two-dimensions: online communication and e-procurement. Existing research on e-business notes that certain e-business initiatives are relatively easy to adopt, whereas others may require organizational structuring (Wu *et al.*, 2003). For example, with the emergence of the internet, the process of online communication can be addressed effectively at a low cost in the travel industry (Law *et al.*, 2004). However, e-procurement calls for exchange interface across businesses and requires specific processes that increase the level of complexity. Due to the perishable nature of tourism products, the adoption of IT for communication processes – with information in a real time – will influence positively on the use of IT for making reservations and procuring e-tickets. Consequently, we hypothesize:

H1. The adoption of online communication with the travel supplier has a positive influence on the adoption of e-procurement.

Antecedents of IT adoption in supply chain relationships

Our conceptual framework, presented in Figure 1, posits that the interaction between buyer-seller in supply chain relationships and environmental factors (customers' IT pressure and industry's IT pressures) are antecedents of e-business adoption as explained below.

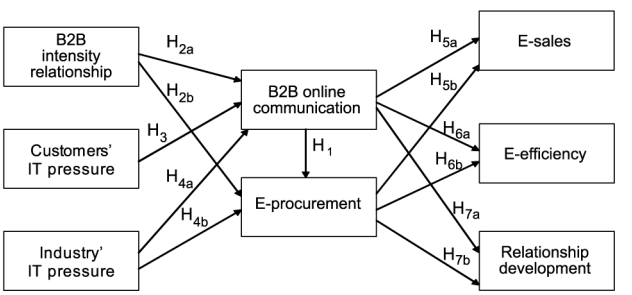
Buyer-seller interactions

Interactions build the atmosphere of the relationship (Hakansson, 1982). Buyer-seller interactions are fundamental to the adaptive learning process, forming the basis of knowledge transfer. That interaction with external firms is a *sine qua non* for generating innovation (Roy *et al.*, 2004). Interaction theorists (e.g. Hakansson, 1982) maintain that adaptation and technological development occur in networks through interactions. The interaction perspective is of interest when explaining the adoption of IT in supply chain (e.g. Achrol, 1991; Achrol and Kotler, 1999; Anderson *et al.*, 1994; Hakansson and Snehota, 1995). Network theory, such as the industrial marketing and purchasing (IMP), posits that technical development in businesses takes places through interactions between individuals (actors), resources, and bonds (relationships).

Buyer-seller interactions in supply chain relationships generate innovation (Roy *et al.*, 2004). A high level of interactions involves higher collaboration and information exchange which, in turn, positively influence innovation in services (Alam, 2002). Taking into account previous studies (Wu *et al.*, 2003; Srinivasan *et al.*, 2002), the adoption of e-business is an innovation of a continuous nature; accordingly, we propose:

H2a. The higher the level of buyer-seller interaction, the greater the adoption of IT in supply chain relationships for online communication.

Figure 1 Conceptual framework



H2b. The higher the level of buyer-seller interaction, the greater the adoption of IT in supply chain relationships for e-procurement.

Customer IT pressures

Previous researchers have examined specific environment-related factors that specifically influence e-business adoption (Wu *et al.*, 2003; Srinivasan *et al.*, 2002). Modern technology has influenced the way people communicate (e.g., increasing the speed of communication). There are now available methods such as e-mail and the internet, which can substantially change the interaction processes between organizations and customers (Leek *et al.*, 2003). Correspondingly, increased customer power will force businesses to adopt new technologies that enable streamlined communications at all points of the supply chain (Wu *et al.*, 2006). Consumer pressures may demand the adoption of innovative processes that they will perceive either to reduce their cost of, or to increase their benefits from (e.g. speediness in communication, enhanced quality of service), dealing with innovative service providers. Correspondingly, increased customer power will force businesses to adopt new technologies that enable streamlined communications at all points of the supply chain (Wu *et al.*, 2003). Therefore, we hypothesize:

H3. The more power customers wield (i.e. customers' IT pressure), the greater the intensity of IT adoption in the area of communications.

Industry IT pressures

Apart from responding to such customer pressures, the organization may also adopt IT because it fears being left behind by other organizations that do so (Wu *et al.*, 2003). Normative pressures play a role in inducing upstream suppliers and downstream channel members to embrace socially accepted norms and behaviors (Grewal and Dharwadkar, 2002). In terms of IT adoption, managers may feel industry pressures when they perceive that other managers in competing businesses are adopting e-business initiatives. Accordingly, we hypothesize:

H4a. The greater the perceived pressures from the other organizations (i.e. industry IT pressure), the greater the adoption in the area of communications.

H4b. The greater the perceived pressures from the other organizations (i.e. industry IT pressure), the greater the adoption in the area of e-procurement.

Outcomes of IT adoption in supply chain relationships

The renewed interest in service productivity and service performance over recent years is primarily the result of the proliferation of IT and the ability to conduct e-business (Brynjolfsson and Hitt, 1998; Karwan and Markland, 2005). Since this revolution is so recent, the literature in service operations has only begun to tackle some of the difficult issues that now confront service managers. Dabholkar (2000) summarized a number of studies which, at times, show seemingly contradictory results. Some describe how basing self-service options on technology has helped organizations maximize efficiency (Dabholkar, 2000; Lovelock, 1995). Together with the analysis of the outcomes of IT in supply chain productivity (i.e. increase in sales and reduction in transactional costs due to the use of internet), we argue that e-business adoption improves the intention to continue the buyer-supplier relationship (i.e. relationship development).

Effects on e-sales

The sales growth generated by online services is a crucial factor in obtaining profitability in investments aimed at establishing e-commerce activities (Bergendahl, 2005). Information flows facilitated by IT adoption in supply chain relationships can help increase the sales volume by reaching customers directly (Lancioni *et al.*, 2003; Wu *et al.*, 2003). Taking into account the nature of services and, in particular, the travel and tourism industry, we assume that the adoption of e-business initiatives (online communication and e-procurement) will enhance sales performance. Accordingly:

H5a. The adoption of online communication is positively associated with enhanced sales performance.

H5b. The adoption of e-procurement is positively associated with enhanced sales performance.

Effects on e-efficiency

According to previous studies, internet can reduce transaction costs, thereby facilitating more efficient exchanges and markets (Berthon *et al.*, 2003). In the context of services' supply chains, IT can simplify business procedures. Companies expect to use the internet to streamline their supply chain and eliminate inefficiencies with increased automation (Lichtenthal and Eliaz, 2003). The application of e-business for online communication and procurement can therefore enhance efficiency by reducing communication and transactional costs. Therefore, we hypothesize:

H6a. The adoption of online communication is positively associated with enhanced efficiency.

H6b. The adoption of e-procurement is positively associated with enhanced efficiency.

Effects on relationship development

The internet has brought about structural changes in business relationships, reinforcing greater B2B collaboration (Avlonitis and Karayanni, 2000). Given the importance of long-term, high quality relationships, it is not surprising that much research has been conducted on the antecedents of such relationships (Van Bruggen *et al.*, 2005). Of the many previously identified antecedents, interdependence is one which has been most extensively researched (e.g. Anderson and Narus, 1990; Geyskens *et al.*, 1996). In the context of e-business adoption, however, relationship development has received substantially less attention. As noted by Bowersox and Daugherty (1995), IT adoption in SCM leads to more strategic partnering. Therefore, online communication can help a business increase the intensity of and enrich the quality of, its interactions with suppliers (Wu *et al.*, 2003). In addition, since e-procurement involves an investment of resources by the firm and its suppliers to ensure that their business processes and systems are mutually compatible, we can admit that such commitment of resources will lead to lasting relationships. In the context of service supply chain relationships, the adoption of IT for B2B processes can reinforce the parties' intentions to continue the relationship. Therefore, we hypothesize:

H7a. The adoption of online communications is positively associated with enhanced relationship development.

H7b. The adoption of e-procurement is positively associated with enhanced relationship development.

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Research methodology

Research approach and sampling frame

As a basis for the methodological approach the present study follows a positivist paradigm. The test of the hypothesized models is carried out by means of an empirical study. We conducted an e-mail survey among managers of Spanish traditional travel agencies. Based on data recorded on the Spanish Association of Travel Agents, we randomly sent out the questionnaire to 600 travel agencies. 105 questionnaires were received, and after carefully checking responses for completeness, we retained 101 survey responses for analysis. The survey asked respondents to focus on their key-input travel supplier (tour operator), that is, the one with highest sales during the summer of 2005. We exclude the suppliers that belong to the same group, to avoid biased responses. Before developing the questionnaire, in-depth interviews with managers of travel associations and principal tour operator managers were carried out in order to further understand the competitive environment and adapt the scales to the context of travel agencies.

Questionnaire and measurement scales

The original survey instrument was pretested through ten travel agencies. A structured questionnaire was developed based on existing measures and scales from the literature as follows (for further details on the specific scales items considered, see Table AI in the appendix).

Environmental antecedents of IT adoption were measured on a five-point Likert scale (1, totally disagree to 5, totally agree) using four items for customers' IT pressure (Wu *et al.*, 2003) and five items for industry's IT pressures (Wu *et al.*, 2003; Srinivasan *et al.*, 2002).

Inter-organizational antecedents of IT adoption were measured through B2B relationship intensity (Leonard-Barton and Sinha, 1993; Heide, 2003) using the percentage of sales with the main wholesaler.

IT adoption was measured using the Wu *et al.* (2003) scale. Specifically, we use three items for e-communication and two items for e-procurement. Both were measured on a five-point scale based on the agreement with the item statement (1, not at all to 5, very much). Taking into account the qualitative study, IT adoption was adapted to the context of travel agencies (see Table AI).

Perceived consequences of IT adoption were measured considering existing research (Jap, 2001; Wu *et al.*, 2003). Specifically, e-sales, e-efficiency and relationship development were selected, with two items by each dimension, and measured on a five-point Likert scale (1, totally disagree to 5, totally agree with the item statement).

Results

Measurement model validation

Confirmatory Factor Analysis (CFA) was used to purify scales with the goal of improving their measurement properties (Anderson and Gerbing, 1988; Gerbing and Anderson, 1988; Netemeyer *et al.*, 2003). A 20-item, seven-dimension confirmatory factor model was estimated using EQS 6.1 (Bentler, 1995). The indices of chi-square, goodness of fit index (GFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), Bentler-Bonnet not normed fit index (BBNNFI) and root mean square residual (RMSEA) were assessed to evaluate overall fit. Criteria were established for fit indices based on a review of empirical research (Guarino *et al.*, 2001; Hu and Bentler, 1999). Specific cut-offs were (GFI, AGFI, CFI, BBNNFI) $>.90$ and RMSEA <0.06.

The convergent validity was assessed by examining the confirmatory factor loadings of each item with its intended construct. The CFA indicated that some modification was needed. Specifically, two items were removed from the customers' IT pressure scale, three from the industry's IT pressures scale and one more from the e-communication scale due in all cases to a low item loading (lower than .50 or not significant t value). The final 14 items, seven dimension scale (see Table I) had a good model fit: $\chi^2 = 68.44$ (df $= 56$, $p = 0.12$); GFI $= 0.91$; AGFI $= 0.83$; BBNNFI $= 0.96$; CFI $= 0.97$ and RMSEA $= 0.04$, providing support for convergent validity. All loadings t values were statistically significant (Steenkamp and van Trijp, 1991) with average factor loadings around 0.70 as recommended by Hair *et al.* (1998).

Regarding the measurement model reliability, Table II provides the composite construct reliability (CR) for each construct. CR is a measure of internal consistency comparable to coefficient alpha (CA) also provided (Fornell and Larcker, 1981). All seven scales demonstrated acceptable levels of composite reliability, with coefficients in excess of 0.70.

Discriminant validity is demonstrated when different instruments are used to measure different constructs and the correlations of these different constructs are relatively weak (Hatcher, 1994). To assess discriminant validity the confidence interval test was developed. This test involves

Table I Means, standard deviations, and standardized loadings for the measures

Measures and items	Mean	Std. deviation	Std. loadings	*t*-value
Customers' IT pressure				
CSTPR1	3.28	1.11	0.864	8.49
CSTPR2	2.99	1.20	0.788	7.77
Industry's IT pressure				
INDPR2	4.32	0.77	0.995	14.14
INDPR5	4.56	0.71	0.415	4.34
E-communication				
ECOM2	2.85	1.28	0.871	8.09
ECOM3	2.89	1.24	0.708	6.74
E-procurement				
EPRO1	4.23	1.15	0.956	10.29
EPRO2	4.65	0.83	0.621	6.40
E-sales				
SALE1	3.53	1.30	0.959	11.64
SALE2	2.98	1.31	0.685	7.51
E-efficiency				
EFFI1	4.09	1.06	0.920	11.31
EFFI2	3.93	1.19	0.837	9.87
Relationship development				
RDEV1	3.30	1.03	0.886	7.53
RDEV2	3.97	0.83	0.662	3.01

Notes: Fit indices are as follows: χ^2(df $= 56$) $= 68.44$ $p = 0.12$; GFI $= 0.911$;AGFI $= 0.833$; BBNNFI $= 0.966$; CFI $= 0.979$; RMSEA $= 0.047$

Table II Descriptive statistics of the constructs in the model

Constructs	CA	CR	Mean	Std. Dev.
B2B relationship intensity (*)	–	–	2.36	0.78
Customer's IT pressure (CSTPR)	0.89	0.81	6.25	2.11
Industry's IT pressure (INDPR)	0.59	0.70	8.88	1.23
E-communication (ECOM)	0.76	0.77	5.74	2.28
E-procurement (EPRO)	0.72	0.78	8.86	1.78
E-sales (SALE)	0.79	0.82	6.51	2.38
E-efficiency (EFFI)	0.87	0.87	8.03	2.11
Relationship development (RDEV)	0.73	0.76	7.27	1.67

Notes: (*) This construct (one-item) was excluded from the confirmatory factor analysis; CA = Cronbach's alpha; CR = composite construct reliability; Constructs are built as a sum of the items

calculating a confidence interval of plus or minus 2 standard errors around the correlation between the factors and determining whether this interval includes 1.0. If it does not include 1.0, discriminant validity is demonstrated (Anderson and Gerbing, 1988). Table III shows that none of these intervals include 1.0, so discriminant validity is assessed. Further support for discrimination of construct is evidenced in the correlations among them. Researchers recommend that constructs that are not too highly correlated demonstrate discriminate validity (Byrne, 2001; Tabachnick and Fidell, 2001), while Kline (1998) offers a specific criterion of $r < 0.85$. As can be observed at Table III, all observed correlations among the constructs meet the conditions to demonstrate discriminant validity.

Table III Discriminant validity assessment

			Confidence interval	
Scales	Correlation	Std error	Lower bound	Upper bound
CP-IP	0.317	0.101	0.115	0.519
CP-EC	0.432	0.107	0.218	0.646
CP-EP	0.441	0.099	0.243	0.639
CP-ES	0.536	0.089	0.358	0.714
CP-EE	0.472	0.096	0.280	0.664
CP-RD	0.199	0.119	−0.039	0.437
IP-EC	0.201	0.108	−0.015	0.417
IP-EP	0.358	0.093	0.172	0.544
IP-ES	0.481	0.083	0.315	0.647
IP-EE	0.467	0.085	0.297	0.637
IP-RD	0.201	0.108	−0.015	0.417
EC-EP	0.408	0.104	0.200	0.616
EC-ES	0.511	0.095	0.321	0.701
EC-EE	0.413	0.103	0.207	0.619
EC-RD	0.471	0.109	0.253	0.689
EP-ES	0.725	0.072	0.581	0.869
EP-EE	0.737	0.070	0.597	0.877
EP-RD	0.354	0.107	0.140	0.568
ES-EE	0.777	0.058	0.661	0.893
ES-RD	0.494	0.098	0.298	0.690
EE – RD	0.293	0.111	0.071	0.515

Notes: CP = Customer's IT pressure; IP = Industry's IT pressure; EC = E-communication; EP = E-procurement; ES = E-sales; EE = E-efficiency; RD = Relationship development

Consequently, these findings generally support the reliability and validity of the constructs and their indicators.

Hypothesis testing

To analyze the antecedents and consequences of IT adoption in travel agencies, structural equation modelling (SEM) was performed to test the theoretical model presented in Figure 1. All analyses were conducted using EQS 6.1. These analyses used the maximum likelihood method of parameter estimation, and all analyses were performed on the variance-covariance matrix. Goodness of fit indices for the final model are presented in Table IV. These indices show that the model provide a good fit to the data. The chi-square statistic is non-significant, χ^2 (9, N = 101) = 17.2, $p = 0.04$ and the GFI, CFI and BBNIF all exceed 0.90.

The results of the hypothesis testing are provided in Table IV, along with parameter estimates (standard estimates) and their corresponding t-values. Figure 2 illustrates the results of the hypothesis testing.

As displayed in Table IV, we found e-communication to be positively associated with e-procurement ($\beta = 0.33$, $p < 0.01$), supporting *H1*. This finding corroborates that internet allows travel agencies to communicate directly with travel suppliers to request information (online communication), which, in turn, has a positive influence on making online reservations and e-procuring services.

As reported in Table IV, we found the buyer-seller interaction (i.e. B2B relationship intensity) to be positively associated with e-communication ($\beta = 0.36$; $p < 0.01$), supporting *H2a*. However, the buyer-seller interaction path to e-procurement, did not show a significant *t* value; we were therefore unable to support *H2b*. The conclusion is that the intensity of B2B relationships does not directly trigger an increased use of internet for making orders or bookings. Results show that, previously, the development of online communication processes is essential. As supported by *H1* and *H2a*, online communication may leverage the use of e-procurement. The hypothesized linkage between B2B relationship intensity and e-business (i.e. online communication and e-procurement) was therefore partially supported.

Regarding environmental antecedents, we found customers' IT pressure to be positively associated with e-communication ($\beta = 0.34$; $p < 0.01$), supporting *H3*. However, industry's IT pressure did not show a significant *t* value for the relationship with e-communication; we were unable to support *H4a*. Such environmental pressures may not have an effect as, in the travel agency sector, the use of internet as a communication channel is widely extended (Law *et al.*, 2004). In spite of this, we found industry's IT pressure to be positively associated with e-procurement ($\beta = 0.27$; $p < 0.01$), supporting *H4b*. On the basis of these findings, we concluded that customers' IT pressure has a direct effect on e-communication and that industry' IT pressure only plays a direct effect on e-procurement. Therefore, it seems that e-business adoption for procurement processes may be driven by reactive influences (e.g. industry' IT pressure).

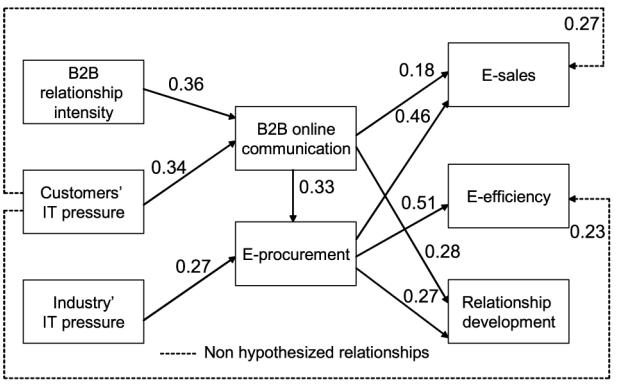
With regard to IT adoption outcomes, this research analyzes two main effects related to the productivity of a firm (sales and costs). First, we found that both e-communication and e-procurement are positively associated with e-sales ($\beta = 0.18$; $p < 0.01$, and $\beta = 0.46$; $p < 0.01$, respectively), supporting *H5a* and *H5b*. However, in the case of cost-savings,

Table IV Antecedents and outcomes of e-business: hypotheses and path coefficients

Hypothesized relationship	Hypothesis	Standard estimates	*t*-value
E-communication → E-procurement	*H1*	0.33	3.36
B2B relationship intensity → E-communication	*H2a*	0.36	4.19
B2B relationship intensity → E-procurement	*H2b*	0.10	1.05 (ns)
Customers' IT pressure → E-communication	*H3*	0.34	3.88
Industry's IT pressure → E-communication	*H4a*	0.06	0.63 (ns)
Industry's IT pressure → E-procurement	*H4b*	0.27	3.00
E-communication → E-sales	*H5a*	0.18	2.17
E-procurement → E-sales	*H5b*	0.46	5.90
E-communication → E-efficiency	*H6a*	0.09	1.16 (ns)
E-procurement → E-efficiency	*H6b*	0.51	6.29
E-communication → Relationship development	*H7a*	0.28	2.96
E-procurement → Relationship development	*H7b*	0.27	2.82
Non-hypothesized relationship			
Customers' IT pressure → E-sales		0.27	3.58
Customers' IT pressure → E-efficiency		0.23	2.89

Notes: Fit indices are as follows: $\chi^2 = (9, N = 101) = 17.2$ ($p = 0.04$); GFI = 0.96; AGFI = 0.85; CFI = 0.96; BBNFI = 0.92; SRMR = 0.048

Figure 2 Antecedents and outcomes of e-business in supply chain relationships



Note: Fit indices are as follows: $\chi^2 = (9, N = 101) = 17.2$ ($p = 0.04$); GFI = 0.96; AGFI = 0.85; CFI = 0.96; BBNFI = 0.92; SRMR = 0.048

only the adoption of e-procurement influences directly on e-efficiency. As reported in Table IV, e-procurement is positively associated with e-efficiency ($\beta = 0.51$; $p < 0.01$), supporting *H6b*. However, e-communication did not show a significant *t* value for the direct relationship with e-efficiency, and we were unable to support *H6a*. As illustrated in Figure 2, our results show that the use of online communication has an indirect influence on e-efficiency through the mediating role of e-procurement. This finding may be explained by the low cost of internet for online communication with suppliers (i.e. by means of the supplier web site). In addition, we analyze the impact of IT adoption on the intention to continue the relationship with the supplier. As expected, research findings support the direct influence of e-business on relationship development. Specifically, e-communication and e-procurement are positively associated with relationship development ($\beta = 0.28$; $p < 0.01$, and $\beta = 0.27$; $p < 0.01$, respectively), supporting *H7a* and *H7b*.

A Lagrange multiplier test (Bentler, 1995) suggested that the model could be significantly improved by adding two new relationships. In particular, our findings evidence the direct effect of customer IT pressure on e-sales and e-efficiency (see Figure 2). As stated in Table I, the model reveals that customers' IT pressure influence directly on e-sales ($\beta = 0.27$; $p < 0.01$) and e-efficiency ($\beta = 0.23$; $p < 0.01$). When travel agencies perceive higher pressures from customers to adopt the internet with their travel suppliers (e.g. hotels, airlines, tour operators), travel agencies perceive increased sales of the supplier products as well as a decrease in transactional and communication costs (e-efficiency). This finding can be explained by the reactive behaviour of travel agencies in order to fulfil the needs of the demanding consumers.

Conclusion

Previous studies emphasize the importance of e-commerce and conceptual effects of the internet on the travel and tourism industry, but empirical evidence has been lacking (Tsai *et al.*, 2005), and in general, this evidence has tended to be rather descriptive (e.g. Law *et al.*, 2004; Suraya, 2005). Focused on travel agencies' supply chains, this study examines and test a model which integrates the antecedents and consequences of adopting e-business, as well as the relationship between its dimensions (i.e. e-communication and e-procurement).

Our findings confirm the influence of e-communication on e-procurement in travel agencies' supply chains. As hypothesized, the adoption of IT for communication processes influences positively on the use of IT for making reservations and procuring e-tickets. By means of internet, the process of e-communication can be adopted effectively at a low cost in the travel industry. Our results confirms that this e-business dimension influences positively on another e-business dimension (i.e. e-procurement).

Regarding the antecedents, as expected, environmental factors and buyer-seller interactions partially enhance e-business adoption. Although the accessibility of online travel web sites might reduce the relevance of travel agencies, i.e. travellers bypassing travel agencies (Buhalis and Licata, 2002), a key

strength of travel agencies is their ability to provide personal information and advice to travellers continuously (Ryan and Cliff, 1997; Van Rekom *et al.*, 1999). By the presence of the internet, customers are devoted to travel agencies that establish e-business relationships with them (i.e. customers' IT pressure). In addition to the power of customers, industry's IT pressures exert an influence on e-business adoption. Our research shows that a reactive behaviour when adopting e-procurement (i.e. the perceived pressure from other competing organizations which adopt e-business initiatives) influence positively on e-procurement.

The importance of IT adoption in supply chains is evidenced by analyzing the direct outcomes of using internet for communication and for procurement processes. Overall, the use of internet in the travel agency relationship with its key supplier has perceived consequences for travel agencies. Specifically, travel agencies perceive increased sales of the supplier products as well as a decrease in transactional and communication costs. Since reducing costs in the supply chain is a means of enhancing cash flows (Srivastava *et al.*, 1999), this research suggests that the adoption of IT in an exchange relationship with a supplier is likely to improve the efficiency of the procurement process. Additionally, IT adoption has relational consequences. Both online communication and e-procurement influence positively on the intention to continue the relationship with the supplier.

Consequently, more than a threat to disintermediation, we have demonstrated that IT adoption in buyer-seller relationships from a supply chain perspective offers enormous business opportunities for travel agencies. Nevertheless, there is a need to integrate the IT adoption within the global marketing strategy (e.g. online and offline marketing strategies).

Managerial implications

From a managerial perspective, it is important to know that the adoption of IT in its two dimensions, online communication and e-procurement, needs to be taken into account by any service business given its positive effects on the sales growth and cost reduction.

This research has shown that the key drivers of the IT adoption for travel agencies supply chains are not only external factors (i.e. customers' IT pressure and industry's IT pressures), but also inter-organizational variables such as the intensity of the buyer-supplier relationships. Consequently, investment in building strong relationships in supply chains becomes a key antecedent for adopting e-business in travel agencies, which, in general, are small-to-medium sized enterprises.

The adoption of IT in a service business seems to cover reasonable series of steps. When B2B relationship is strong enough, this interaction contributes to the development of e-communication and, in turn, it addresses the generation of e-procurement actions. Therefore, managers need to be aware of the related risks that emerge when the IT adoption in SCM starts directly by e-procurement which, as explained in the paper, requires specific complex processes that can be even more complicated without the implementation of its expected antecedent (i.e. e-communication).

Research findings show that e-procurement has positive effects on sales and cost reduction. The adoption of e-procurement, however, is basically explained by industry pressure, i.e. this adoption mainly of a reactive nature. If a service business belongs to an industry where its working environment (i.e. competitors, partners and suppliers) do not require specific e-procurement processes for B2B, there is a trend of no adoption and, therefore, without the benefits of the mentioned advantages. Consequently, a manager working in a low pressure environment (e.g. specialized travel agencies in a niche market), has the opportunity to obtain competitive advantages if the service firm acts proactively and sets up the development of e-procurement.

Online communication is a necessary preliminary previous step for the development of e-procurement, but on its own, e-communication cannot decrease transactional costs. The manager should let him/herself be misled by the growth in sales that bring about the adoption of online communication, and stop working in the direction of IT adoption. The manager needs to realize that taking the step towards e-procurement will also serve to improve profits via cost reduction, thus increasing e-efficiency.

Based on the relationship marketing approach, long-term benefits are consolidated not through occasional transactions, but through enduring relationships with suppliers and customers. Assuming this essential basis, managers should not overlook one of the main findings of this research: the adoption of IT for online communication and e-procurement sustains favourable long-term relationships.

Limitations and further research

This study has certain limitations which can be addressed in future research. Even though this study is cross-sectional, it may be interesting to develop a longitudinal study to know what the evolution of this phenomenon is, as far as its application is recent and will change in the near future. Further research could also integrate the study of the e-business supply chain from a dyadic approach. Furthermore, new e-business antecedents could be considered as well as outcomes.

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Appendix

Table AI Measurement

Environmental antecedents of IT adoption	
Customers' IT pressure	
CSTPR1	Many of our customers are keen that our travel agency should implement e-business practices with their suppliers (hotels, tour operators, airlines, etc.)
CSTPR2	Our relationship with our major customers would have suffered if we had not implemented e-business practices
CSTPR3	Our customers may consider us as forward if we implement e-business initiatives (*)
CSTPR4	Our customers demand that we establish e-business relationships with them (*)
Industry's IT pressure	
INDPR1	A large number of our competitors have already adopted e-business practices (*)
INDPR2	We would be considered technology-deficient if we did not implement e-business practices
INDPR3	In the travel agency industry, firms that do not readily adopt new technologies will be left behind (*)
INDPR4	It is important that we are seen as a cutting edge business that adopts innovative technologies (*)
INDPR5	In our industry, most travel agencies will ultimately end up adopting a wide range of e-business practices
Inter-organizational antecedents of IT adoption	
***B2B relationship intensity*: % of sales with the wholesaler in the summer 2005 season, of the total sales of your agency. (Options: less than 10%, between 10%-29%, between 30%-60%, between 61%-80%, between 81%-100%)**	
IT adoption in travel agency supply chains	
E-communication	
ECOM1	Use online communication to ask for travel booklets (*)
ECOM2	Provide specific online information about product specifications that our travel suppliers must meet
ECOM3	Share product and planning information with our travel suppliers
E-procurement	
EPRO1	Track orders with suppliers electronically (i.e. online order placement)
EPRO2	Make your reservations and procuring your e-tickets
Perceived consequences of IT adoption	
E-sales	
SALE1	(With the use of internet) the sales volume of the supplier's products has increased
SALE2	(With the use of internet) commissions deriving from this supplier's products have increased
E-efficiency	
EFFI1	(With the use of internet) the costs of communication (time, telephone expenses, etc.) have been substantially reduced
EFFI2	(With the use of internet) the costs of general management activities have been substantially reduced
Relationship development	
RDEV1	(With the use of internet) our travel agency has been able to strengthen its existing business relationships with partners and suppliers
RDEV2	(With the use of internet) our relationship with this travel supplier is likely to last longer

Note: (*) Deleted items based on the validation process

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Executive summary and implications for managers and executives

This summary has been provided to allow managers and executives a rapid appreciation of the content of this article. Those with a particular interest in the topic covered may then read the article in toto *to take advantage of the more comprehensive description of the research undertaken and its results to get the full benefits of the material present.*

The relentless advance of information technology continues to change our lives, and online means of buying a product or service, or a display of choices of what is on offer, or price comparisons, have become integral parts of many people's purchase habits.

Good news for the customers who have all the information they need, and the opportunity to select and buy, at their fingertips. Good news, too, for suppliers who have a fast and reliable means of communicating with customers and potential customers, and an efficient method of storing their identities, choices and preferences for future marketing purposes.

However, what is good news for some is bad news for others. Take the travel agency business, for instance. IT has not only given those customers who used to pop into the office, or telephone, to buy a holiday or business trip, it has given them the means to cut out the travel agent altogether and buy directly online from the hotel, airline, cruise-ship company or car-hire firm.

Even so, predictions of the demise of the travel agent as intermediary have been somewhat exaggerated. In fact the adoption of IT provides significant opportunities for tourism intermediaries. The ability of a travel agency to build and sustain relationships with its suppliers and customers, together with the adoption of IT in order to upgrade its distinctive competencies (i.e. intelligence-based intermediaries to meet customers' interests) supports the importance of analyzing IT in travel agency supply relationships.

That analysis is provided by J. Enrique Bigné *et al.* who study the levels of IT adoption in a supply chain; assess the influence of B2B interactions and environmental factors on IT adoption; and examine the implications of IT adoption for business performance, including sales performance, efficiency, and relationship development.

They advise that investment in building strong relationships in supply chains is a key antecedent for adopting e-business in travel agencies, which, in general, are small-to-medium sized enterprises.

Much of the research into supply chain management (SCM) has focused on manufactured goods, but it is it is believed that service providers can benefit by applying some best practices from manufacturing to their processes. For instance, IT adoption in SCM leads to more strategic partnering and greater reliance on time-based strategies, along with more transparent logistics, organizational structures, and increased emphasis on performance measurement.

Thanks to the internet, online communication can be carried out effectively at low cost in the travel industry – with corresponding positive outcomes for making reservations and procuring e-tickets.

Increased customer power forces businesses to adopt new technologies that enable streamlined communication throughout the supply chain. "Many of our customers are keen that we should implement e-business practices with their suppliers (hotels, tour operators, airlines, etc.)" being a typical travel agent view.

Similarly, pressure is applied in the form of a fear of getting left behind if other organizations adopt IT: "It is important that we are seen as a cutting-edge business that adopts innovative technologies" and "In the travel agency industry, firms that do not readily adopt new technologies will be left behind."

From a managerial perspective, it is important to know that the adoption of IT for online communication and e-procurement needs to be taken into account by any service business given its positive effects on the sales growth and cost reduction.

Key drivers of the IT adoption for travel agency supply chains are not only external (i.e. pressure from customers and the industry to adopt IT), but also inter-organizational variables such as the intensity of the buyer-supplier relationships – hence the need to have strong supply chains.

When B2B relationship is strong enough, this interaction contributes to the development of e-communication and, in turn, it addresses the generation of e-procurement actions. Managers need to be aware of the related risks that emerge when the IT adoption in SCM starts directly by e-procurement, which requires specific complex processes that can be even more complicated without the implementation of its expected antecedent (i.e. e-communication).

Research findings show that e-procurement has positive effects on sales and cost reduction. The adoption of e-procurement, however, is basically explained by industry pressure, i.e. mainly of a reactive nature. If a service business belongs to an industry where its working environment (i.e. competitors, partners and suppliers) do not require specific e-procurement processes for B2B, there is a trend of no adoption and, therefore, without the benefits of the mentioned advantages. Consequently, a manager working in a low-pressure environment (e.g. specialized travel agencies in a niche market), has the opportunity to obtain competitive advantages if the service firm acts proactively and sets up the development of e-procurement.

Online communication is a necessary preliminary previous step for the development of e-procurement, but on its own, e-communication cannot decrease transactional costs. Managers should not overlook one of the main findings of this research: the adoption of IT for online communication and e-procurement sustains favorable long-term relationships.

(A précis of the article "B2B services: IT adoption in travel agency supply chains". Supplied by Marketing Consultants for Emerald.)