

# E-business and fast growth SMEs

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**Abstract** This paper tests a theoretical model to evaluate e-business capability and value in the fast growth small-to-medium enterprise (SME) context. We propose that e-business value depends on how fast growth SMEs deploy IT resources, strategic planning, culture, and business partnerships to develop e-business capability and business process competence which help these companies to achieve outstanding business performance. Structural equation modelling is employed to test our theoretical conceptualization on a cohort of 310 Australian fast growth SMEs across different industrial sectors. The results show that IT resources, strategic IT alignment, market orientation, and business partnerships do contribute significantly and indirectly to SME performance through the development of e-business capability and business process competence. Our study provides an initial empirical evidence to understand the relationship

between IT and entrepreneurial SME performance. These findings have important implications for research and business practices.

**Keywords** E-business capability · E-business value · Business process competence · Resource-based view of the firms theory · Fast growth SMEs

**JEL Classifications** M15 · O33 · L26

## 1 Introduction

Firms are increasingly incorporating electronic business (e-business) into their existing information systems (IS) and business processes in order to speed up transactions along value chain activities, achieve real-time communication, lower transaction costs, and enhance flexibility (Lee and Whang 2001). E-business constitutes an integral component of most firms' business strategies, helping companies to grow, identify new markets, and outperform their competitors. In the present research, e-business is defined as the application of Internet-based technologies to conduct both downstream and upstream business activities along the value chain (Zhu and Kraemer 2005).

IS research (Rai et al. 2006; Sambamurthy et al. 2003) highlights the importance of digitization for technology use and firm performance. Specifically, the adoption, use, and value of e-business now constitute a vibrant research domain (Mishra et al. 2007; Zhu and

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Kraemer 2005), contributing significantly to the literature. Notwithstanding, extant research is limited essentially in two ways. First, investigations testing an integrated model of the antecedents and consequences of e-business are rare. Ex ante research has explored the relationships between IT investments and firm performance (Bharadwaj et al. 1999), IT use and firm performance (Armstrong and Sambamurthy 1999), and determinants of IT use (Teo et al. 2003). Nevertheless, the IT payoff literature, in general, has not considered IT usage, whereas the usage literature has largely overlooked issues concerning firm performance (Mishra et al. 2007). Accordingly, a nuanced understanding of the process of IT use and associated implications is absent in the literature.

Second, the ongoing debate on e-business value has focused predominantly on large firms, with comparatively little attention paid to SMEs. It is widely acknowledged that SMEs are a major part of the industrial economies (OECD 2014). For example, in the USA, small businesses area seedbed for the creation of two-thirds of new jobs, contributing to 39 % of GNP (Johnston et al. 2007). In Europe, 99.8 % of firms are classified as SMEs, constituting two-thirds of turnover and business employment (Carayannis et al. 2006). In Australia, about 94–96 % of businesses can be categorized as SMEs, contributing to an estimated 30 % of GDP (OECD 2014). Fast growth SMEs<sup>1</sup> represent a substantial proportion of power in the small business sector and creating wealth, income, and jobs (Delmar et al. 2003). Surprisingly, there is a dearth of literature focusing on the way in which fast growth SMEs utilize e-business to create business advantage.

In the present study, we aim to narrow these gaps, synergizing the literature to achieve a comprehensive understanding of e-business value creation process in the SME context. We provide initial empirical evidence to understand how fast growth SMEs leverage e-business innovation to achieve outstanding business performance via building and enhancing essential organizational capabilities and competences. An overarching research question addressed by this

study is: In what way, does e-business help fast growth SMEs to achieve business value?

This paper is structured as follows. The theoretical background section introduces the tenets of RBV, which forms the backbone of our research model for hypothesis formulation. The research method section outlines the procedures used for data collection, validation of the measurement properties of the constructs, and the test of the proposed research model. Next we present our findings and finally conclude with a discussion of findings, implications for research and practice, limitations, and potential avenues for future research.

## 2 Theoretical foundation

Rooted in strategic management theory, the RBV explains how enterprises succeed and gain business advantage through treatment of resources and capabilities as central considerations in strategy formulation and as primary sources of profitability (Barney 1991). The RBV differentiates between resources and capabilities: while firms use resources to create products, capabilities, however, are developed from resources employed in repeatable patterns for these same purposes (Sanchez et al. 1996). Further, while resources are generally regarded as inputs to or outputs from organizational processes, it is not possible to embed resources within organizations and their processes. Capabilities are firm-specific and embedded in firm processes and routines, transforming inputs into outputs to generate value (Newbert 2007). Thus, capabilities are viewed as incorporating reliable services, repeated processes, product innovations, manufacturing flexibility, responsiveness to market trends, and short product development cycles (Amit and Schoemaker 1993). Makadok (2001, p. 387) suggests that firms create value from two complementary, but distinct, mechanisms: “resource-picking” and “capability-building”. These mechanisms are complementary rather than being mutually exclusive. Costly-to-imitate resources and capabilities are regarded as fundamental drivers of superior performance.

The RBV theory has been used to examine the efficiency and competitive advantage implications of specific firm resources and capability in the entrepreneurship field (Alvarez and Busenitz 2001).

<sup>1</sup> We define fast growth SMEs as those enterprises that “are willing to take risks, to be innovative, and to initiate aggressive competitive actions” and grow faster than their industry sector average (Upton et al. 2001, p. 61).

The origin of RBV and its relationship with firm growth can be found in the seminal work of Penrose (1959) which proposes that a firm is an assembly of resources, and that business growth can be explained through the availability of idle resources. The existence of idle resources and the need to find applications for them allow a firm to improve efficiency which, in turn, constitutes the main incentive for a firm to grow (Penrose 1959). From this perspective, firm growth can be understood as a sequential path-dependent process in which entrepreneurial firms combine the exploitation of resources with the development of new resources and capabilities (Pettus 2001).

RBV has been employed to analyse the competitive advantage implications of IT. Although IT per se (e.g. hardware, software) does not provide distinctive advantage because it can be commoditized through competitive imitation and acquisition, leveraging IT with other organizational resources and managerial skills can help firms to gain sustainable business advantage (e.g. Mata et al. 1995). IS researchers (Kohli and Grover 2008; Melville et al. 2004) have suggested that research on IT business value should explore the relationships between resources, a firm's capability to deploy IT for improved performance using intermediated business process approach. According to Javidan (1998), competitive advantage evolves from a firm's resources via a sequential process: conversion of resources into capabilities, development of capabilities into competencies, and transformation of competencies into competitive advantage. Following this logic, we develop our integrated model of resources, e-business capability, business process competence, and e-business value. We aim to explore how entrepreneurial SMEs combine resource qualities to exploit resources in order to develop e-business capability and achieve e-business value.

In this study, e-business capability is defined as a firm's ability to leverage e-business technology in order to conduct upstream and downstream value chain activities. According to Porter (2001), it is critical for organizations to extend their boundaries and link integrated processes with upstream (i.e. suppliers/business partners) and downstream (i.e. customers) partners along value chains. In line with this view, we conceptualize e-business capability as a multidimensional construct encompassing five

dimensions: communication with customers, order taking, internal communication, procurement, and communication with partners. This conceptualization is consistent with Zhu (2004), who suggested that e-business capability represents a firm's ability to use e-business to support order cycle activities along a value chain including providing information to customers, facilitating transactions, and working together with suppliers/partners to fulfil customer orders. These five dimensions are discussed below.

## 2.1 Communication with customers

Companies use e-business technology to communicate with customers. For example, Web-based systems provide useful information about a firm's products and services, and navigation and online purchase functionalities to customers. Web-based systems are a communication platform to familiarize customers with company protocols, enabling direct online choice and purchase of customized products (Zhu 2004).

## 2.2 Order taking

Provision of Web-based information can lead to online purchases or business transactions. E-business capability includes online transaction functions, involving taking customer orders, accepting customer payments electronically, and enabling customers to track their order status (Zhu 2004).

## 2.3 Internal communication

Internal communication refers to use of e-business to facilitate internal communication between employees in different departments and different locations, manage projects, and coordinate new product development teams in the focal firm (Wu et al. 2003).

## 2.4 Procurement

Procurement refers to use of e-business to link with suppliers for purchasing input materials (Zhu 2004). E-business capability involves the ability to enable firms to search and locate potential suppliers online, to place and track orders with suppliers electronically, and to employ online marketplaces to source suppliers (Wu et al. 2003).

## 2.5 Communication with partners

Firms need to work and communicate effectively with their suppliers/business partners to fulfil customer orders. E-business capability can enable firms to work closely with suppliers/business partners to develop, coordinate, fulfil, and deliver products and services on time, meeting customers' specifications (Wu et al. 2003).

In the IS field, IT business value refers to the organizational performance impacts of IT at both the intermediate process level and organizational level (Bharadwaj et al. 2013; Kohli and Grover 2008; Melville et al. 2004; Wade and Hulland 2004). Within the e-business literature, e-business value is defined as firm performance impacts of e-business (Raymond et al. 2005; Soto-Acosta and Merono-Cerdan 2008; Zhu and Kraemer 2005). E-business provides SMEs with great potential for value creation by linking companies, suppliers, and customers in new and innovative ways. E-business enables SMEs to achieve operational, managerial, and strategic advantages such as greater internal and external process integration, closer links with customers and business partners, greater market penetration and expansion, richer information for decision-making, better competitive intelligence, and greater access to external resources and expertise which contribute to the development of small businesses (Eikebrokk and Olsen 2007; Giovannetti et al. 2015; Raymond and Bergeron 2008; Raymond et al. 2005). Researchers of SMEs have found a positive correlation between e-business and transaction cost reductions (Eikebrokk and Olsen 2007), increased market efficiency (Elia et al. 2007; Raymond and Bergeron 2008), and perceptions of information support and competitive advantage (Elaine and Patrick 2005; Raymond et al. 2005).

Although these studies suggest a positive link between e-business and SME performance, there is limited research that has explored the actual e-business value creation through inter-firm business processes which leads to improved SME performance. IS scholars (Barua et al. 2004; Rai et al. 2006; Sambamurthy et al. 2003; Wade and Hulland 2004) claim that examinations of IT business value creation should take into account the indirect role played by IT in firm performance through intermediate business processes, which will improve our understanding of the mechanism of IT value creation in the digital business

context. IT-enabled organizational capability transforms resources and combines them with organizational processes, helping firms to create value by developing inter-firm business competences and improving performance (Bharadwaj et al. 2013; Pavlou and El Sawy 2006). In the e-business area, researchers (Amit and Zott 2001; Ray et al. 2004; Soto-Acosta and Merono-Cerdan 2008) highlight that a business process approach should be employed to understand the generation of e-business value because the electronic networks of companies make e-business an inter-organizational activity. In line with these views, this study examines e-business value creation through the development of business process competence which is enabled by e-business capability. E-business capability helps SMEs to create value by increasing transactional efficiencies, facilitating information sharing and coordination, and enhancing responsiveness and innovativeness (Eikebrokk and Olsen 2007; Raymond and Bergeron 2008). Such e-business value leads to improved SME performance in sales and operations. We conceptualize business process competence into three dimensions: information sharing, coordination, and responsiveness.

## 2.6 Information sharing

Information sharing entails effective and efficient knowledge distribution of business environments, markets, and customer preferences between companies and their business partners so as to effectively serve customer needs (Kim et al. 2006). Information sharing involves timely responses to environmental dynamisms. Effective information sharing between value chain members helps SMEs to do businesses in an efficient manner reducing bullwhip effects, and increasing flexibility and responsiveness along the entire value chain (Lee et al. 2000).

## 2.7 Coordination

Coordination refers to transaction-related capability, ranging from identification of customer needs, collection of product-related information, and follow-up between firms and their business partners to fulfil customer orders (Wu et al. 2006). Coordination reflects a SME's ability to orchestrate and match various resources and tasks, and to perform business activities so as to achieve effectiveness.

### 2.8 Responsiveness

Responsiveness is an ability of firms and their business partners to sense, identify, and respond collaboratively and effectively to environmental changes or new market developments (Kim et al. 2006). Responsiveness demonstrates the dynamic, flexible, and adaptable nature of the organizational competence, allowing SMEs to develop and renew firm-specific resources in order to adapt to shifts in environments (Wu et al. 2006). Responsiveness also entails an innovative ability to design new products and business models, to create new value for customers, and to tap into new market segmentations.

### 3 Research model and hypothesis development

Figure 1 depicts a hypothesized model of IT resources, strategic IT alignment, market orientation, business partnerships, e-business capability, business process competence, and e-business value and is followed by discussion and formulation of testable hypotheses.

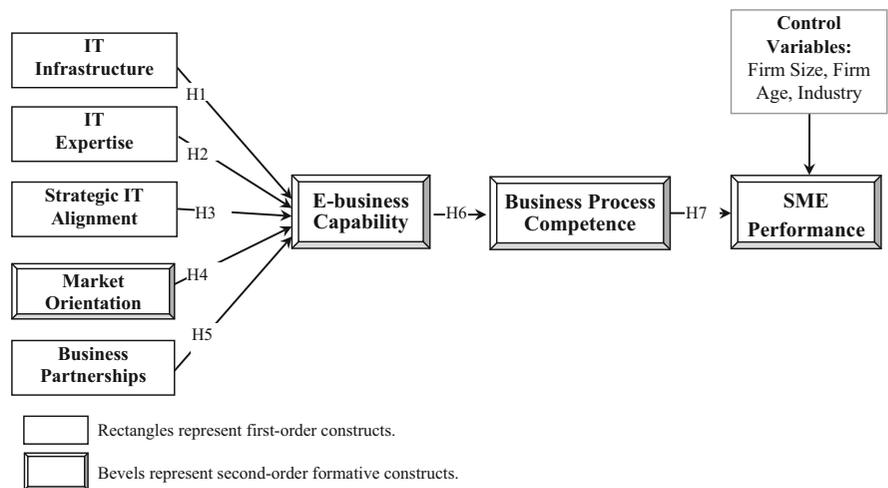
E-business is enabled by the existing technology base in use by an organization. Solid and flexible IT infrastructure enables firms to innovate and to make continuous improvement to products/services so as to attain business advantage (Zhu and Kraemer 2005). IT infrastructure provides a reliable technological platform on which e-business capability can be built, helping organizations to communicate internally and

also with business partners along value chains, to take customer orders online, and to speed up transaction processes (Zhu 2004). IT infrastructure fosters strong links between focal firms and their trading partners, enabling firms to share information, coordinate, innovate, and exploiting business opportunities, and facilitating adaptation to changes in business environments (Rai et al. 2006). A reliable and flexible IT infrastructure fosters strong links between fast growth SMEs and their suppliers/business partners and customers, leading to the development of robust e-business capability (Bi et al. 2015). Thus, we hypothesize that:

**H1** IT infrastructure impacts positively on e-business capability.

IT technical skills contain employees’ knowledge of programming, system analysis and design, and competencies in emerging technologies (Bharadwaj 2000). Fink and Neumann (2007) posited that IT employees with extensive business experience and skills in IS development enable firms to integrate IT strategy and business strategy, to develop reliable and cost-effective systems for businesses, and to anticipate business needs sooner than competitors. In regard to e-business innovation, researchers (Lin and Lin 2008; Zhu and Kraemer 2005) suggest that IT expertise increases the propensity for firms to successfully develop e-business capability. Not surprisingly, fast growth SMEs that have IT employees holding necessary technical skills and knowledge about e-business tend to develop e-business applications effectively and enable these firms to use e-business to conduct

Fig. 1 Research model



business activities along the value chain efficiently (Bi et al. 2015). Thus, we hypothesize that:

**H2** IT expertise impacts positively on e-business capability.

Strategic IT alignment represents patterns of deployment of IT applications to support business strategies geared towards reducing costs and increasing revenue (Tallon et al. 2000). Strategic IT alignment is a strategic planning resource, helping to ensure that firms use IT and implement IT-based strategies successfully (Powell and Dent-Micallef 1997). IS research (Kearns and Lederer 2003) demonstrates that firms capable of creating symbiotic IT planning relationships tend to effectively align IT resources and organizational resources with strategic purposes and market positions in order to reduce cost and increase productivity, and to achieve sustainable IT-based competitive advantage. Recent IS research (Cragg et al. 2011; Oh and Pinsonneault 2007) also highlights that aligning IT strategy with business objectives leads to SME business success. Strategic IT alignment links firm performance by providing a basis for focal firms to integrate different business processes within value chain members, permitting members to codify jointly valuable market knowledge into explicit strategies, and coordinating strategic planning processes that are critical for organizing and allocating resources effectively (Wu et al. 2006). Thus, we hypothesize that:

**H3** Strategic IT alignment impacts positively on e-business capability.

Market orientation is a firm's culture that "most effectively creates the necessary behaviors for the creation of superior value for buyers and, thus, continuous superior performance for the business" (Narver and Slater 1990, p. 21). Market orientation consists of competitor orientation and customer orientation, which is a valuable cultural resource. Fast growth SME research (Tan et al. 2014) highlights that market-oriented behaviour is a key determinant of business advantage. Competitor orientation involves an ability and willingness to identify, analyse, and respond to competitors' actions (Narver and Slater 1990). Using target rivals as benchmarks, competitor-oriented businesses identify their own strengths and weaknesses on an ongoing basis (Han et al. 1998). Attention to competitive factors provides businesses

with a proactive disposition to shape their competitive environments and strategies (Jaworski and Kohli 1993). Businesses engaged in environmental scanning and adaptation are highly likely to lead their industry, implementing e-business practices and exhibiting robust levels of e-business capability (Li et al. 2010). Competitor-oriented enterprises understand how to use e-business technology to enhance communication internally and externally, and to coordinate processes, appreciate their current market position, and to be prepared to take on new challenges (Wu et al. 2003). Furthermore, businesses with heightened sensitive to competitors' initiatives tend to invest intensively in order fulfilment processes and are prepared to take advantage of timely investments (Hurley and Hult 1998). Customer orientation involves an organization's ability to understand target buyers in order to create superior value, to take proactive actions towards meeting customer needs, and to predict future market requirements (Narver and Slater 1990). Customer-oriented firms tend to build innovation capabilities and improve customer value through technologies (Hurley and Hult 1998). Customer-oriented businesses are likely to be proactively disposed towards technological innovations that facilitate efficient customer transactions and robust customer relationships (Li et al. 2010). Moreover, customer orientation leads to boundary spanning and collaborative activities across firms to handle customer needs efficiently and to develop responsive value chains that are attuned to market changes (Han et al. 1998). Accordingly, customer-oriented businesses are more likely to adopt proactive approaches that enhance e-business capability in operational processes. Based on the above arguments, we hypothesize that:

**H4** Market orientation impacts positively on e-business capability.

Business partnerships are strategic associations between independent firms, acknowledging a high level of interdependence to achieve mutual benefits (Lee and Lim 2005). Open and trusting business partnerships are often associated with mutually compatible benefits (Powell and Dent-Micallef 1997). Owing to a lack of resources, rapid growth SMEs tend to engage proactively in inter-organizational partnerships to build resources during rapid growth phases (Beekman and Robinson 2004). Close partnerships reflect the degree to which firms coordinate their

strategic activities such as collaborative planning, forecasting, and replenishment (Esper and Lisa 2003). Within the digital business context, strategic business relationships facilitate sharing and integration of planning, resources, and competencies (Kim et al. 2006). Close business relationships enable firms to carry out their operational activities efficiently (Choe 2008). Empirical research (Dong et al. 2009; Rai and Tang 2010) suggests that business partnerships enable firms to use e-business successfully along value chain processes, facilitating communications, strategic integration processes, and leveraging IT strategically. Thus, we hypothesize that:

**H5** Business partnerships impact positively on e-business capability.

Drawing upon the RBV, we explain the interconnectivity between e-business capability, business process competence, and SME performance. E-business capability is built upon and enhanced by resources within and across organizations, and is embedded within business processes along value chains. The greater the extent of e-business use, the more likely firms will create e-business capability (Zhu and Kraemer 2005). Because e-business extends SME's boundaries and links integrated business processes among value chain members, firms with high levels of e-business capability tend to leverage internal and external resources effectively and efficiently, to enhance information sharing, strategic collaboration and coordination, and responsiveness within and across firms, and therefore lead to business process competence (Raymond et al. 2005). Thus, we hypothesize that:

**H6** E-business capability impacts positively on business process competence.

Business process competence is an e-business-enabled organizational capacity involving strategic processes that help SMEs to reconfigure and redeploy existing resources/capabilities so as to generate value-creating strategies when opportunities arise. Business process competence is not only an integral component of the organizational fabric tightly connected with resources, but also active, involving knowledge integration and learning processes. Business process competence involves inter-firm resources such as strategic partnerships, knowledge and learning integration, and managerial strategic decisions, and

incorporates timely data sharing, proactive coordinated production, and quick analytic responses to environmental changes among chain members. Fast growth SMEs identifying, exploiting, and fitting intangible e-business capability with their business processes to develop close relationships with business partners can create agile, flexible, and dynamic business process competence. Effective business process competence enables SMEs to share information, schedule procurement, production, and distribution operations synchronously, and respond to market dynamisms together with business partners swiftly (Arend 2006; Vaaland and Heide 2007). SMEs endowed with superior inter-firm business process competency can achieve e-business value by outperforming competitors through efficient order handling procedures and short delivery lead time, thereby leading to improved sales performance and operational efficiency (Paulraj et al. 2008). Thus, we hypothesize that:

**H7** Business process competence impacts positively on SME performance.

## 4 Research method

### 4.1 Target population and survey sample

The data used for testing our hypothesized model were collected through an online survey of 1335 Australian fast growth SMEs compiled by Business Review Weekly (BRW). The BRW fast growth enterprises are similar to Fortune's FSB 100 annual list of North America's fastest growing small companies. Key inclusion criteria for SMEs to enter the BRW fast growth project are that their previous year's turnover must exceed AUD\$500,000; they must have fewer than 200 full-time employees; they cannot be a subsidiary of an Australian or overseas corporation; and they must not receive more than 50 % of their revenue from a single client.

### 4.2 Data collection procedures

A personalized email highlighting the academic nature of the study was sent to either the founder or CEO of all 1335 fast growth SMEs on the BRW database. In our emails, we emphasized the importance of having

respondents with a good understanding and overview of their firm's e-business activities to participate in our survey, urging the founder or CEO to personally complete the online questionnaire, where possible. A follow-up email was sent 3 weeks after the initial one and a second reminder email another 2 weeks later. Respondents were assured of confidentiality. A total of 310 responses were obtained, which gave a gross response rate of 28.1 %, after discounting 195 incorrect email addresses and 32 SMEs which declined to participate. All responses were filled by either the company founder or its CEO.

We first tested the sample for non-response bias, using the approach suggested by Armstrong and Overton (1977). Differences in responses to all the constructs between early respondents (i.e. those that completed the survey upon the first invitation) and late respondents (i.e. those who replied to follow-up emails) were compared. Independent sample *t* tests on each construct failed to reveal significant differences between early and late respondents (all *p* values >.05), suggesting that non-response bias was not an issue.

**Table 1** Profile of responding firms

	% ( <i>n</i> = 310)
Industry	
Information technology	18.8
Property and business services	18.1
Personal and other services	9.6
Finance and insurance	8.9
Communications	6.6
Others <sup>a</sup>	38
Company age	
Less than 5 years	49
More than 5 years	51
Previous year growth rate	21.9–759.5
CEO/founder's education level	
Tertiary	53.9
MBA	16.6
Year 12	13.7
PhD or doctorate	1.8
Other	14.0

<sup>a</sup> Other industry sectors include construction, retail trade, manufacturing, health and community services, wholesale trade, education, transport and storage, accommodation, café, restaurants, mining, cultural and recreational services

The profile of the responding firms in our study (Table 1) shows that our sample contains companies in all major industry sectors. There is also equal distribution of companies in terms of their age (or years of establishment). All responding firms had achieved a growth rate in excess of 20 %.

#### 4.3 Common method bias

As our study used a self-administered questionnaire and respondents were in a senior management position qualified to assess firm performance, measurement was subject to cognitive biases due to participants "seeking to present themselves in a favorable manner" (Thompson and Phua 2005, p. 541). Anticipating such a possibility, we incorporated Marlowe and Crowne's (1961) Social Desirability Scale in our online questionnaire, inviting participants to complete this section as part of the survey. The incorporation of Marlowe and Crowne's (1961) Social Desirability Scale in our questionnaire enabled us to assess all study items for social desirability response bias in order to address internal validity and psychometric aspects of instruments. Marlowe and Crowne's (1961) Social Desirability Scale has been used widely for checking cognitive biases (Ballard 1992).

In this study, we tested common method bias using SEM procedures recommended by Podsakoff et al. (2003). First, we conducted a Harman's one-factor test. Results culminated in eleven factors corresponding to the latent variables reported in the present study. These factors accounted for 72 % of the variance with the first factor accounting for 30 %. No single factor accounted for more than 50 % of the variance. Second, we controlled for the effects of a directly measured latent method factor, that is, SD. An examination of structural parameters for both models shows that all measurement items load high on their respective factor, but low on the SD factor. Non-significant relationships were found between SD and all research constructs (all *ps* > .05). Finally, we incorporated a method factor in the measurement model to evaluate the variance explained by substantive factors and the method factor. On average, the substantive constructs explained 84 % of the variance across the measures while the method factor explained only 0.8 %. Taken together, these tests provide evidence that common method bias is not a serious problem for this study.

#### 4.4 Operationalization of constructs

This study operationalized the constructs using multi-item reflective measures on seven-point scales ranging from *Strongly Disagree* (1) to *Strongly Agree* (7). Table 2 presents the final instruments.

As control variables, we used number of employees to measure firm size, employed number of years since business start-up to measure firm age, and used a series of industry dummies to control for exogenous factors at the industry level.

#### 4.5 Data analysis

We employed SmartPLS (Ringle et al. 2005) for data analysis. PLS is a structural equation modelling (SEM) technique that uses a component-based approach to estimation. Because of the large number of variables relative to the sample size and the existence of second-order formative constructs and moderating effects, PLS was deemed more appropriate than other SEM techniques such as LISREL and AMOS. We used the bootstrapping re-sampling method with 500 samples and  $n = 310$  cases per sample in the full model.

We first used SPSS for verifying construct validity and reliability for the reflective first-order factors. Convergent and discriminant validity is confirmed by exploratory factor analysis: (1) all items loaded on the expected factors with a loading score greater than 0.50. Moreover, the own factor loading scores are higher than all cross-loading scores. (2) All eigenvalues of the first-order constructs are larger than the suggested value of 1.0; (3) the communality scores are all higher than the suggested value of 0.50. These results indicate adequate reliability (Hair et al. 2006).

Second, construct reliability was assessed by identifying the composite reliability scores of the first-order constructs generated from PLS, all of which are above 0.89, suggesting acceptable internal consistency. The square roots of the average variance extracted are greater than all other cross correlations. This shows that all first-order constructs capture more construct-related variance than error variance. These results demonstrate adequate convergent and discriminant validity for all first-order constructs.

To test for multicollinearity, collinearity diagnostics for all constructs were also conducted. The analysis shows that the tolerance values and their

inverse VIFs (as shown in Table 3) are all less than the acceptable cut-off points 3.33 (Cenfetelli and Basselier 2009). These findings imply no major multicollinearity problems.

## 5 Results

As shown in Fig. 2, the results indicate that the overall research model was supported. IT infrastructure has a positive effect on e-business capability, supporting H1 ( $\beta = .19, p < .001$ ). IT expertise has a positive effect on e-business capability, supporting H2 ( $\beta = .19, p < .001$ ). Strategic IT alignment positively facilitates e-business capability, supporting H3 ( $\beta = .20, p < .001$ ). Market orientation significantly enhances e-business capability supporting H4 ( $\beta = .12, p < .05$ ). Business partnerships impact positively on e-business capability, supporting H5 ( $\beta = .27, p < .001$ ). E-business capability has a significant impact on business process competence, supporting H6 ( $\beta = .55, p < .001$ ). Business process competence impacts positively on e-business value, supporting H7 ( $\beta = .69, p < .001$ ). This model accounts for 46 % of the variance in e-business capability, 30 % of the variance of business process competence, and 47 % of the variance in e-business value. Among control variables, none of them showed significant effects in the research model.

Tests of mediating effects of e-business capability and business process competence involve three major steps suggested by Baron and Kenny (1986). First, we estimated the partial impact of each independent variable (IV) (IT infrastructure, IT expertise, strategic IT alignment, market orientation, business partnerships) on dependent variable (DV) (e-business value) without the presence of mediators (e-business capability, business process competence). Findings reveal that all regression coefficients of all IVs are positive and significant for DV (Table 4). Second, we further estimated the impact of both mediators on DV. Regression coefficients of both e-business capability and business process competence are positive and significant for DV (Table 4). Finally, we estimated a full model involving direct paths from IVs and two mediators to DV. Estimation of a full model shows that regression coefficients of direct paths from all IVs to DV fail to reach statistical significance. However, the paths from all IVs to mediator 1 (e-business capability), from mediator 1 (e-business capability) to

**Table 2** Constructs and indicators

## IT infrastructure—adapted from Zhu and Kraemer (2005)

ITIF1: Our company has a good telecommunication infrastructure

ITIF2: Our company's IT systems infrastructure is very flexible in relation to future needs

ITIF3: Our company's IT systems enable us to effectively cooperate electronically with suppliers/business partners and customers

## IT expertise—adapted from Lin and Lin (2008)

ITEP1: Our IT people are generally aware of e-business functions

ITEP2: Our company hires highly specialized and knowledgeable IT people for e-business

ITEP3: Our IT people are well trained in e-business

## Strategic IT alignment—adapted from Kearns and Sabherwal (2006)

SITA1: Our IT plan is strategically integrated with overall business plan

SITA2: Our IT plan reflects our company's mission, goals, objectives, and strategies

SITA3: Our IT plan is based on a review of business plan and supports business strategies

*Market orientation: formative measure formed by competitor and customer orientation*

## Competitor orientation—adapted from Narver and Slater (1990)

COMO1: Our company responds rapidly to competitor's actions

COMO2: Our managers regularly discuss competitors' strengths and weaknesses

COMO3: Our company believes that analysing and responding to competitors' actions is crucial to maintain competitive advantage

## Customer orientation—adapted from Narver and Slater (1990)

CUSO1: Our business objectives are driven by customer satisfaction

CUSO2: Our competitive advantage is based on understanding customers' needs

CUSO3: Our business strategy is driven by the goal of increasing customers' satisfaction

## Business partnerships—adapted from Dong et al. (2009)

BP1: Our company develops strategic plans in collaboration with business partners

BP2: Our company projects and plans future strategic activities with business partners

BP3: Collaboration in strategic planning with business partners is something our company always does

*E-business capability: formative measure formed by communication with customers, order taking, internal communication, procurement, and communication with suppliers/partners*

## Communication with customers—adapted from Wu et al. (2003)

COMC1: We use e-business to provide customers with general information about our company

COMC2: We use e-business to send customers regular updates about new products and other developments within our company

COMC3: We use e-business to provide solutions to customer problems

## Order taking—adapted from Wu et al. (2003)

ORDT1: We use e-business to accept orders electronically from customers

ORDT2: We use e-business to accept payments electronically from customers

ORDT3: We use e-business to allow customers to track and inquire about their orders electronically

## Internal communication—adapted from Wu et al. (2003)

ITCM1: We use e-business to facilitate internal communication between employees in different departments and different locations

ITCM2: We use e-business to facilitate discussions and feedback on various issues of importance to our company

ITCM3: We use e-business to regularly update employees about developments within our company

## Procurement—adapted from Wu et al. (2003)

PROC1: We use e-business to search and locate potential suppliers online

PROC2: We use e-business to place and track orders with suppliers electronically

PROC3: We use online markets to source suppliers

## Communication with partners—adapted from Wu et al. (2003)

**Table 2** continued

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COMP1: We use e-business to send suppliers/business partners regular updates about new product plans and other new developments with our company

COMP2: We use e-business to provide specific online information about product specifications that suppliers/business partners must meet

COMP3: We use e-business to share product and inventory planning information with suppliers/business partners

*Business process competence: formative measure formed by information sharing, coordination, and responsiveness*

Information Sharing—Adapted from Kim et al. (2006)

INFS1: Our company exchanges more information with our business partners than our competitors do with theirs

INFS2: Our company benefits more from information sharing with our business partners than do our competitors from theirs

INFS3: Our information sharing with our business partners is superior to the information shared by our competitors with theirs

Coordination—adapted from Kim et al. (2006)

COOR1: Our company is more efficient in coordination activities with our business partners than are our competitors with theirs

COOR2: Our company conducts transaction follow-up activities more efficiently with our business partners than do our competitors with theirs

COOR3: Our company conducts the coordination activities at less cost than do our competitors with theirs

Responsiveness—adapted from Kim et al. (2006)

RESP1: Compared to our competitors, our company responds more quickly and effectively to changing customer and supplier needs

RESP2: Compared to our competitors, our company responds more quickly and effectively to changing competitor strategies

RESP3: Compared to our competitors, our company develops and markets new products more quickly and effectively

*SME performance: formative measure formed by sales performance and operational efficiency*

Sales performance—adapted from Wu et al. (2003)

SP1: Compared with our competitors, the market share of our products has increased

SP2: Compared with our competitors, the sales area has widened

SP3: Compared with our competitors, our company performs much better in market development

SP4: Compared with our competitors, our company performs much better in product development

Operational efficiency—adapted from Wu et al. (2003)

OE1: Over the previous 12 months, the costs of coordinating with business partners and customers have been reduced

OE2: Over the previous 12 months, the costs of production and transaction (e.g. raw material, order processing, warehousing, and scheduling costs) in our company have been substantially reduced

OE3: Over the previous 12 months, the costs of marketing the product (e.g. advertising and promotion costs) have been substantially reduced

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mediator 2 (business process competence), and from mediator 2 (business process competence) to DV (EBV) are positive and significant (Table 4). In sum, these tests support the full mediating role of e-business capability and business process competence.

## 6 Discussion

This study culminates in five significant findings. First, our results suggest that both IT infrastructure and IT expertise help fast growth firms to enhance e-business capability through the effective application of e-business technology in value chain processes. Second, our

findings indicate that strategic IT alignment is associated positively with e-business capability, providing empirical support for the argument that successful use of IT by SMEs hinges on how companies align their IT strategy with business objectives, a key determinant for achieving the strategic value of IT (Cragg et al. 2011; Oh and Pinsonneault 2007). Third, the results demonstrate a positive relationship between market orientation and e-business capability, highlighting how rapid growing companies exhibit a market-oriented culture in order to capitalize on market opportunities by employing e-business innovation in the value chain processes. Fourth, beyond IT resources and internal organizational resources, we find that

**Table 3** Descriptive statistics, correlation matrix, and AVEs of constructs

	Mean (SD)	$\alpha$	VIF	1	2	3	4	4a	4b	5	6	
1. ITIF	5.53 (1.08)	.83	1.57	<b>.83</b>								
2. ITEP	4.65 (1.69)	.86	1.69	.49	<b>.80</b>							
3. SITA	5.27 (1.49)	.91	1.92	.42	.50	<b>.85</b>						
4. MO	–	–	–	.22	.32	.41	–					
4a. COMO	5.12 (1.36)	.88	1.44	.13	.21	.29	.77	<b>.84</b>				
4b. CUSO	6.23 (0.84)	.80	1.57	.23	.31	.38	.89	.39	<b>.75</b>			
5. BP	4.29 (1.61)	.95	1.81	.27	.30	.35	.28	.24	.23	<b>.93</b>		
6. EBC	–	–	–	.44	.49	.51	.36	.25	.33	.49	–	
6a. COMC	5.45 (1.35)	.78	2.21	.35	.43	.50	.31	.16	.32	.27	.78	
6b. ORDT	4.41 (1.77)	.77	1.61	.28	.34	.36	.26	.17	.25	.26	.67	
6c. INCM	5.37 (1.59)	.93	1.49	.37	.34	.34	.28	.18	.27	.34	.68	
6d. PROC	4.17 (1.51)	.72	1.58	.32	.34	.31	.23	.15	.22	.33	.67	
6e. COMP	4.18 (1.78)	.89	2.11	.28	.33	.33	.23	.23	.17	.50	.80	
7. BPC	–	–	–	.40	.38	.50	.40	.39	.30	.52	.53	
7a. INFS	4.36 (1.34)	.95	2.28	.35	.32	.43	.23	.25	.15	.44	.45	
7b. COOD	4.53 (1.24)	.91	2.70	.39	.30	.43	.30	.28	.22	.48	.44	
7c. RESP	5.26 (1.11)	.78	2.10	.26	.33	.40	.52	.49	.41	.38	.43	
8. SMEP	–	–	–	.29	.31	.38	.48	.37	.43	.44	.47	
8a. SP	5.48 (1.25)	.89	1.96	.22	.28	.37	.37	.35	.28	.37	.37	
8b. OE	4.26 (1.31)	.78	1.54	.21	.23	.32	.22	.27	.12	.31	.43	
	6a	6b	6c	6d	6e	7	7a	7b	7c	8	8a	8b

1. ITIF

2. ITEP

3. SITA

4. MO

4a. COMO

4b. CUSO

5. BP

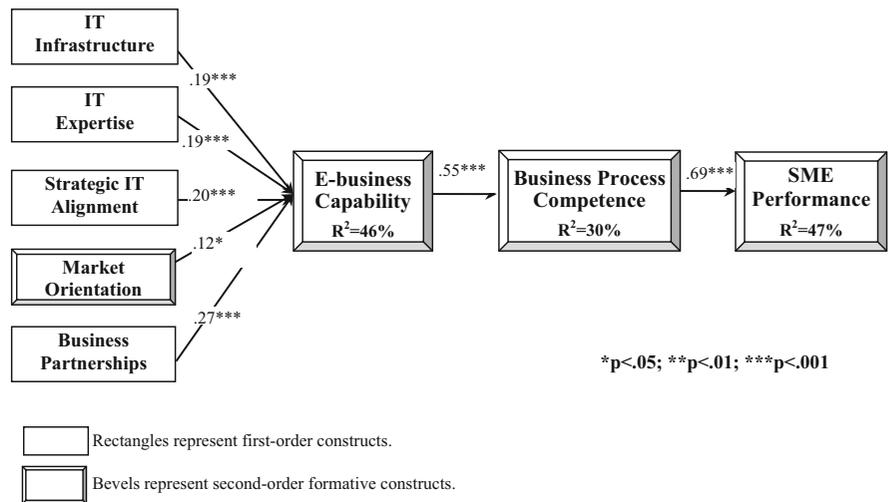
**Table 3** continued

	6a	6b	6c	6d	6e	7	7a	7b	7c	8	8a	8b
6. EBC												
6a. COMC	<b>.74</b>											
6b. ORDT	.43	<b>.69</b>										
6c. INCM	.47	.24	<b>.79</b>									
6d. PROC	.36	.44	.28	<b>.68</b>								
6e. COMP	.55	.45	.35	.44	<b>.86</b>							
7. BPC	.37	.40	.33	.41	.41	–						
7a. INFS	.28	.35	.24	.40	.38	.85	<b>.92</b>					
7b. COOD	.31	.31	.29	.36	.33	.91	.70	<b>.88</b>				
7c. RESP	.34	.34	.32	.27	.30	.72	.37	.53	<b>.74</b>			
8. SMEP	.34	.35	.32	.36	.34	.64	.46	.58	.60	–		
8a. SP	.28	.31	.24	.26	.27	.62	.43	.55	.60	.82	<b>.83</b>	
8b. OE	.29	.32	.32	.31	.31	.41	.33	.39	.31	.76	.30	<b>.73</b>

The diagonal elements are the square root of the AVE

Constructs 4, 6, 7, and 8 are second-order constructs that are formatively measured. All other constructs are reflectively measured first-order constructs

**Fig. 2** PLS results of structural model



**Table 4** Results of mediating effects tests

IV	M1	M2	DV	IV → DV	IV → M1	IV + M1 + M2 → DV			Mediating
						IV → DV	M1 → M2	M2 → DV	
ITIF	EBC	BPC	SMEP	.30***	.19***	.071	.55***	.69***	Full
ITEP	EBC	BPC	SMEP	.34***	.19***	.072	.55***	.69***	Full
SITA	EBC	BPC	SMEP	.46***	.20**	.073	.55***	.69***	Full
MO	EBC	BPC	SMEP	.49***	.12*	.026	.55***	.69***	Full
BP	EBC	BPC	SMEP	.45***	.27***	.060	.55***	.69***	Full

IV independent variable, M1 mediator 1, M2 mediator 2, DV dependent variable, ITIF IT infrastructure, ITEP IT expertise, ITBP SITA strategic IT alignment, MO market orientation, BP business partnerships, EBV e-business value

\* p < .05; \*\* p < .01; \*\*\* p < .001

business partnerships, as an external firm resource, are associated positively with fast growth SME performance, suggesting that external relational resources involving knowledge, strategic planning, and collaboration are critical, valuable, and idiosyncratic for entrepreneurial firms to gain business value in today's highly competitive market (Dobbs and Hamilton 2007). Finally, we find that e-business capability is related positively to business process competence which in turn creates e-business value. This finding confirms the notion that e-business use can be regarded as a missing link to IT payoff (Zhu and Kraemer 2005).

Tests of mediation demonstrate that all antecedent resources have significant indirect effects on e-business value via the intermediate linkages of e-business capability and business process competence which exploit both intra- and inter-firm business synergies. The findings confirm the RBV theory, indicating the synergistic effects of IT resources and other organizational resources on building firm capabilities which in turn transform resources into business processes and competences, thus leading to business value.

We extend extant knowledge in six salient ways. First, we contribute to IS research by incorporating resources and business processes (i.e. order fulfilment, inter-firm business processes) into conceptualization of e-business capability and business process competence. Distinctive, non-imitable, and non-substitutable resources are key sources of advantage, providing inter-firm performance differentials. Utilizing resource-picking and capability-building mechanisms, we explain how and why e-business capability and business process competence, enabled by complementary resources and process embeddedness, are more valuable for firms when creating advantage than just adoption and application of IT per se. By demarcating specific type of firm capabilities and competences, we provide an enhanced understanding of the sources of IT-based competitive advantage.

Second, we inform an enduring debate about the business value of IT. We suggest that IT alone might not hold an answer to IT value creation, but rather technology works in tandem with other intra- and inter-organizational resources to build specific organizational capabilities embedded within business processes, helping firms to create value. Specifically, IT business value depends on how firms use IT to improve value chain operations. We investigate

intermediate IT-enabled processes and the specific ways in which IT is employed by firms to enhance their core business processes by conceptualizing and differentiating IT-enabled organizational capability.

Third, we contribute conceptually and methodologically to IS research by introducing two new theoretically multidimensional instruments for capturing e-business capability and business process competences in digital business environments. These theory-driven latent organizational capability constructs are applicable for research across different industry sectors because they have been developed and validated against a cross-sectional sample of firms. The advancement in measurement is in line with the recent call for closer attention needing to be paid to auxiliary theory development in IS research that focuses on theoretical conceptualization and measurement model development (Kim et al. 2010).

Fourth, we provide initial empirical evidence supporting the positive relationship between strategic IT alignment and fast growth SME performance. While extensive empirical research has found that IT strategy alignment is positively associated with business performance, the strategic use of IT in the SME context still remains uncertain. Our results demonstrate that strategic IT alignment is a valuable planning resource, helping entrepreneurial SMEs to create value by virtue of how IT is employed to support core process activities.

Fifth, we expand the extant literature and demonstrate that market orientation, as a valuable organizational culture resource, is an important antecedent for firms to embrace IT innovation. We also contribute to the extant literature by delineating how market orientation when bundled with other organizational resources to create IT-enabled organizational capability can help firms to achieve business advantage, helping to fill this gap by demonstrating the competitive value of market orientation and its relationship to specific capability-building processes.

Finally, we contribute to the fast growth company literature by investigating how entrepreneurial SMEs align their IT investments with complementary business practices and organizational structures to create business advantage. Our study explores the nature of the relationship between IT and entrepreneurship and provides initial empirical evidence suggesting that "IT is the magic ingredient that inspires and most often enables contemporary entrepreneurial endeavors" (Del Giudice and Straub 2011, p. vi).

We provide four important insights for management, particularly for highly entrepreneurial firms. First, we provide a theoretical framework for managers to understand how IT investments help firms to create strategic advantage and achieve financial performance in the digital business environments. Managers should be aware that superior business advantage depends on the ways how firms combine resource qualities to develop unique organizational capabilities and competences that contribute to business success.

Second, IT strategy is an integral and tightly woven part of business strategy within innovative firms, enabling them to achieve competitive advantage. Strategic IT alignment plays a prominent role in IT success and is therefore a key concern for top management. In today's fast changing environments, managers are advised to develop their managerial skills not only to seek out, find, and recognize strategic opportunities, but also to effectively adjust IS plans in accordance with changes in corporate strategy so as to sustain their businesses particularly in turbulent markets.

Third, market orientation is a valuable firm resource. The synergy of combining market orientation with other organizational resources helps firms to create dynamic business competences that can lead to superior competitive advantage. Business success largely hinges on how managers balance market orientation and innovativeness to promote cooperative activities with value chain members, to enhance new product development, and to increase customer value. Therefore, managers need to be cognizant of the potential limitations of investing in market orientation alone.

Finally, we highlight the importance of characteristics such as IT resources, strategic planning, firm culture, and business partnerships on heightened levels of organizational capabilities. These findings exemplify the collective responsibility of senior management, and business and IT executives in heightening e-business success, providing empirical support for the principle of normative collective responsibility.

The present study involves three principal limitations, providing avenues for future research. First, a cross-sectional research design was utilized in which data were collected at a single point in time. Analysis of static, rather than longitudinal parameters, limits

inferences associated with relationships between constructs and cannot establish causality of arguments (Bowen and Wiersema 1999). Future research might consider utilizing longitudinal methods, investigating the evolutionary nature of e-business capability, dynamic capability, and sustainable e-business value over a relatively long period of time.

Second, utilization of single informants (CEO/founder) presents another limitation. Single-informant studies are susceptible to perceptual or attitudinal bias when interpreting results. Accessing multiple sources of information not only taps complexities, but also strengthens both the reliability and validity of findings (Bruggen et al. 2002). Future research might consider comparing data obtained from managers across IT, marketing, and operational functions. In addition, researchers might supplement primary data collection with that obtained from secondary sources such as company annual reports, media reports, and online information.

A third limitation relates to sample characteristics upon which the present hypotheses are tested. The current investigation focused on a specific type of SME, that is, fast growing firms, the characteristics of which may limit generalizability of the findings. For example, high growth SMEs are innovative and IT planning-oriented with a high percentage of degree-educated people who may have had some IT-related courses/training as part of their studies and professional qualification (Levy and Powell 2005; Raymond et al. 2005; Storey and Greene 2010). It is possible that other types of SMEs that are less innovative and IT planning-oriented or have different staff profiles may yield different results. Therefore, further research is necessary to determine whether these findings are generalizable.

## 7 Conclusion

Fast growth SMEs represent a small, yet significant business sector, stimulating national employment growth and contributing favourably to global economies. The ability to grow and establish themselves within their chosen markets in a relatively short period of time makes fast growth enterprises an interesting target for academic researchers. This study has developed, theorized, and empirically tested a theoretical model incorporating IT resources, strategic IT

planning, market orientation, and business partnership factors to assess e-business capability and e-business value creation in the fast growth SME context. This research provides what appears to be a first step towards an understanding of how IT helps fast growth SMEs to gain business value. We hope that this study motivates further discussion and encourages the advancement of theory that helps us to improve our understanding of the IT business value in fast growth firms.

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