



# Could e-business create a competitive advantage in UK SMEs?

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## Abstract

**Purpose** – This paper aims to improve the understanding of e-business, competitive advantage and their roles in the UK SMEs. This paper uses case studies to examine what is needed for SMEs to change from an “old” traditional business strategy to a new “e” business strategy.

**Design/methodology/approach** – A range of academic and practitioner literature related to IT, e-business, and different business models is reviewed. Nine case studies were used to collect information from SMEs in the UK.

**Findings** – It may be possible for some SMEs to integrate the internet technology into an overall strategy and this new technology could lead to a competitive advantage. However, owners’ attitudes towards new technology, the knowledge and skills of management and the workforce are recognised as potential problematic issues.

**Originality/value** – The results of an academic literature review and nine case studies were employed to construct a prototype of an e-business model named “Competitive Advantage Through E-business” (CATE-b). In that respect the CATE-b prototype model identifies possible e-business application areas and proposes a plan for e-business integration.

**Keywords** Electronic commerce, Competitive advantage, Small to medium-sized enterprises, United Kingdom

**Paper type** Research paper

## Introduction

The economic environment in which businesses find themselves today is perhaps the most turbulent in history. It is dominated by three powerful influences: globalisation, the knowledge and information revolution, and structural change in organisations (Booz Allen Hamilton, 2002). The internet, fibre optics and satellite communications have launched an enormous technological revolution, the effects of which will be felt throughout the twenty-first century (Sprano and Zakak, 2000). The new global network of these technologies have created the platform that will revolutionise the competitive landscape for corporations and redefine the means through which countries do business within an ever-closer world (Sprano and Zakak, 2000). Owing to these technological developments organisations that seek to be successful in the future are striving for the implementation of a successful e-business strategy. This is a major issue in the business world and is affecting every type of organisation as they attempt to improve efficiency and stay competitive (Rodgers *et al.*, 2002). Waters (2000) indicates that e-business has become an inescapable fact of life, nearly as essential to commerce as the telephone. It has even been suggested that firms today cannot compete without some kind of e-business strategy (Rodgers *et al.*, 2002). However, research shows that although UK small and medium-sized enterprises (SMEs) are



rapidly adopting the internet they are slow to adopt e-business as the basis for business communication and transaction (DTI, 2003).

This paper offers a conceptual understanding of the development of e-business focusing on the SMEs' willingness and ability to adapt to changes in the business environment created by e-business and the internet. The existing models of strategy and planning may need to be replaced with a new e-business model that will create opportunities for SMEs to create a competitive advantage.

### **Aims and objectives**

- Review the academic and practitioner literature related to IT, e-business, and different business models, which have arisen due to technological advances.
- Establish to what extent SMEs are using e-business and to determine the drivers and barriers in SMEs for adopting the internet as a basis for their business.
- Investigate and discuss the context of government expectations, its current involvement in the development and encouragement of SMEs to adopt e-business, and to what extent the government initiatives are accepted and/or ignored by SMEs.
- Explore industry's behaviour and organisational culture in relation to the creation of competitive advantage.
- Develop and evaluate a new prototype of e-business model for SMEs to facilitate organisational effectiveness and speed in the new era of e-economy.
- Identify research gaps, propose further studies and recommend improvements.

### **Research methodology**

The primary research methods used for this study were literature review and interviews with owner-managers of SMEs. A viable prototype of an e-business model was constructed based on the literature reviewed and nine case studies. This study has adopted an exploratory research approach (Yin, 2003) with the purpose to provide a level of understanding of SMEs' behaviour, their adaptability to the new economic demands and the possibility of creating competitive advantage by using e-business. The choice of companies in which to carry out the study was pragmatic and opportunistic, rather than purposive. This research is based on a multiple case study methodology (Yin, 2003) in which semi-structured interviews was used to collect data from SMEs' owners/managers. Access to all companies was achieved via senior managers who were all personally known to the researcher. The role of the researcher was to interpret events (Yin, 2003).

In this exploratory study nine SMEs owners/managers were interviewed and the results are summarised in Table IV. Overall, our sample consists of two medium, one small and six micro companies. These SMEs were all based within a radius of 60 km of Sheffield, UK and covered a range of industrial and commercial activities. However, the sample did contain six micro businesses, which may have biased our views about the ability of SMEs to adopt e-business as a means of creating a competitive advantage (DTI, 2003). Considering that micro businesses make up the vast majority of UK businesses (DTI, 2003) it was considered prudent to present this data. Owing to the variety of SMEs in this study we were able to present:

- *Two in-depth case studies (Gripple Ltd and SMP Europe)*. These were two manufacturing companies with a considerable existing IT infrastructure. Owing to their similar size, IT capabilities and the type of the industry sector, comparison was possible.
- *A summary of seven other case studies*. These were companies of different size, with a rudimentary IT infrastructure, and they belonged to various industry sectors. Therefore, their direct comparison was not possible. However, findings from these companies were summarised and some comments made by the owners/managers were used to reinforce some points made.

### Literature review

For many companies, after the expansion of e-mail and web sites, the next big step has been the development of e-commerce. Although the focus of this study is not on e-commerce but rather on e-business it is necessary to explain the difference between the two. While e-commerce focuses primarily on transactions with a firm's customers, e-business expands the connectivity of the organisation to include its suppliers, employees and business partners (Rodgers *et al.*, 2002; Searle, 2001; Martin and Matlay, 2001). This expanded connectivity makes e-business solutions much more prominent than in the use of e-commerce. E-business is seen as the next wave in the technological revolution created by the internet (Biggs, 2000).

#### *Defining e-business*

There is a no universally accepted definition of e-business. Consequently, the term e-business is used interchangeably (Fillis *et al.*, 2003) and/or is mistaken (Lawson *et al.*, 2003) with the term e-commerce and other related phrases. E-business means different things to different people (Searle, 2001), and the term has been variously defined (Rodgers *et al.*, 2002; Searle, 2001; Martin and Matlay, 2001). To make the term e-business clearly understood, in this study we adopted the definition used by IBM (Van Hooft and Stegwee, 2001, p. 44):

A secure, flexible and integrated approach to delivering differentiated business value by combining the systems and processes that run core business operations with the simplicity and reach made possible by Internet technology.

E-business is a powerful vehicle for different kinds of improvement within a company. It can be used for effectively managing the transformation of a traditional business strategy that represents the old economy into a new e-economy that symbolises a modern and visionary business approach (Van Hooft and Stegwee, 2001). Although e-business allows for the extended organisation to be connected together (Van Hooft and Stegwee, 2001) it is still a relatively new and under-developed practice in UK SMEs (Waters, 2000; Lifting, 2002). Therefore, for owner-managers who have become aware of the benefits associated with e-business applications and wish to duplicate these results, knowledge and understanding of e-business and its practices are essential (Kalakota and Robinson, 2001; Local Futures Group, 2001; DTI, 2003). Interestingly, King and Clift (2000) argue that "e" will soon be dropped and that e-business will be business as it comes to be generally understood.

The definition of e-business and the arguments above imply that e-business is more than just technology. It is about thinking what customers need. It is using the internet

and other information and communication technologies (ICT) to increase business performance and success. The most important function of e-business is its interconnectivity and system interaction. As a result of e-business automation, many human functions are eliminated from various processes such as unnecessary keyboard input, intervention and internal reprocessing of electronic business information (Follit, 2000). Efficiency improvement resulting from faster processing and reduced errors is then realised in routine data processes and business interactions (Follit, 2000). Furthermore, e-business allows service providers to interact with their suppliers and customers and in exchange this improved relationship results in increased loyalty, increased profits and a competitive advantage (Rodgers *et al.*, 2002). The key to e-business success is to understand how customers work as well as adapting the management of the business. It is a simple yet powerful concept which connects customers, employees, suppliers and distributors to the business systems and information that they need (Van Hooft and Stegwee, 2001; Rodgers *et al.*, 2002; Koh and Maguire, 2004).

#### *Drivers and barriers in SMEs for adopting the internet*

Despite the fact that 1.9 million small businesses in the UK are connected to the internet, surpassing the government's original goal of 1.5 million (DTI, 2003), the UK's *Federation of Small Businesses* (Lifting, 2002) research indicates that the use of the internet by SMEs is still relatively undeveloped. SMEs still tend to use the internet only to send e-mails, transfer files or documents or gather information. Although this statistical evidence suggests that new media technologies are being used by SMEs, some questions emerge: why is it that more SMEs do not take advantage of modern technologies and what is affecting the use of the technology available? Table I shows a range of factors thought to be influencing SMEs and their managers when deciding whether or not to adopt and invest in modern technologies.

Throughout the literature it has been argued that effective adoption and implementation of ICT may rely quite a lot on individual factors such as organisational size, structure, mix of available human and financial resources and capabilities (Supri *et al.*, 2000). Studies so far show that although SMEs are more flexible and more adaptable to change (Carrier, 1994; d'Amboise and Muldowney, 1988), can act faster (Katz, 1970) and are more receptive to new ideas and techniques (Hitt *et al.*, 1991; Woo, 1987), they lack the human and financial resources and capabilities of large firms (Ettlie, 1983; March, 1981). Therefore, they face limitations in purchasing and implementing new systems.

Lynn *et al.* (1999) argue in their study that while speed, flexibility and the receptivity to new processes work to the advantage of the small firm, the lack of financial resources of SMEs makes it critical for them to pick their strategies carefully. The UK's *Federation of Small Businesses* (Lifting, 2002) complements that study by suggesting that many small businesses still do not own a computer. Cost is still a major barrier for those companies with a turnover of less than £50,000. In contrast, studies of Hoffman and Novak (1996) suggest that if SMEs can overcome the initial problem of acquiring the basic IT infrastructure, the cost effectiveness of the new media would provide a viable alternative for SMEs. They found that the internet provides an effective channel for advertising, marketing, distributing goods and information services, all of which are believed to be the main sources for gaining a competitive

**Table I.**  
Examples of drivers and barriers for adopting the internet strategy in SMEs

Drivers	Barriers
<p>Improve business competitiveness (Chapman <i>et al.</i>, 2000)</p> <p>Opportunity to try out new e-business models (Sadowski <i>et al.</i>, 2002; Docherty and Simpson, 2003)</p> <p>Availability of better and faster communication and information channels, accessible global market etc (Chappell <i>et al.</i>, 2002)</p> <p>Endless opportunities, based on cost, rather than for strategic reasons (Sadowski <i>et al.</i>, 2002)</p> <p>Increased sales (Actinic, 2002)</p> <p>“It may sound obvious but having a web site gives people the impression that you are a forward thinking business” (Bradshaw, 2001)</p> <p>As a company grows in size it becomes more difficult to communicate with its customers so that e-business and the internet become more important (Daniel and Myers, 2001; Actinic, 2002; <i>UK Online</i>, 2002)</p> <p>External pressures by new customers and their value proposition of “what, when and how they want it, at the lowest cost” (Kalakota and Robinson, 2001)</p>	<p>Lack of SME bespoke information (Chappell <i>et al.</i>, 2002)</p> <p>Mistrust of the IT industry (Van Akkeren and Cavaye, 1999)</p> <p>E-technology readiness and adoption vary by industry sector (Bodorick <i>et al.</i>, 2002; Martin and Matlay, 2001)</p> <p>Limited resources in terms of time and effort to incorporate IT facilities (Chappell <i>et al.</i>, 2002)</p> <p>Ignorance surrounds the technology fuelling concerns about security, return on investment, costs, legislation and interoperability (Timmers, 1999)</p> <p>Complexity of available e-services and insufficient access to strategic resources (Bodorick <i>et al.</i>, 2002; Sadowski <i>et al.</i>, 2002)</p> <p>The older the SME the less likely they were to use e-technology (Daniel and Myers, 2001; Docherty and Simpson, 2003)</p> <p>High running costs, lack of awareness of what e-technology involves shortage of technological skills, insufficient knowledge and education, absence of help and time (Darch and Lucas, 2002)</p>

(continued)

Drivers	Barriers
<p>Responding to competitors (Daniel and Myers, 2001; Sadowski <i>et al.</i>, 2002)</p>	<p>Inadequate telecommunication infrastructure, lack of trust and the perceived lack of relevance of e-technology to the particular industry sector (Docherty and Simpson, 2003)</p>
<p>To enhance customer relationships (Daniel and Myers, 2001) UK Government provides help from the point of view that the internet is a “good” thing (Martin and Matlay, 2001)</p>	<p>Perceived benefits by owner/managers in SMEs (Iacovou <i>et al.</i>, 1995; Kirby and Turner, 1993; Thong and Yap, 1995) – owner/managers do not necessarily think that the Internet is a “good” thing</p>
<p>The internet as a “lifesaver” for ailing businesses (Wroe, 2002). It was suggested that some small businesses only exist because of moving onto the internet and the notion of the internet as a salvation for businesses appears to be a relatively new idea</p>	<p>Most businesses do not want to use the internet for online trading, preferring instead to use ICT to augment changes in how they connect with their customers and reduce costs through more efficient management of their internal processes (<i>UK Online</i>, 2002)</p>
<p>Low entry costs leading to an early return on investment whilst safeguarding such investments (Timmers, 1999). It is argued that internet and e-business create almost perfect competition as barriers to entry are reduced, transaction costs lowered, customers are able to obtain better access to information, customer driven pricing is possible and all with the minimum of legislation and regulation</p>	<p>Many small businesses still do not own a computer and cost is still a major barrier for those companies with a turnover of less than £50,000 (Lifting, 2002)</p>

(continued)

Table I.

Drivers	Barriers
<p>Technology brings more flexibility and SMEs are more adaptable to change because of their size (Carrier, 1994; d'Amboise and Muldowney, 1988). In this new global market SMEs can act faster (Katz, 1970) and are more receptive to new ideas and techniques (Hitt <i>et al.</i>, 1991; Woo, 1987)</p>	<p>Lack of education, IT skills and computer literacy as well as unwillingness of managers to be responsible for technological change (Kalakota and Robinson, 2001; Kirby and Turner, 1993; Thong and Yap, 1995; DTI, 2003; Local Futures Group, 2001)</p>
<p>Web provides less costly (Verity and Hof, 1994) and a more effective (Hoffman and Novak, 1996) channel for advertising, marketing and distributing goods and information services</p>	<p>Owing to dramatic changes in e-technology, market expectations and market responses, the opportunities for SMEs are clearly in improving their existing skill profile if they are to compete in the new e-economy. Local Futures Group (2001) suggests that increasing the knowledge and skills base of SMEs across the board, especially in low-knowledge industry sectors holds the key to transforming SMEs. Their research shows a high correlation between knowledge intensity in the SME sector, and the state of e-commerce development at a local level</p>
<p>As data have become more abundant and less costly, SMEs would use information in more sophisticated way (Fann and Smeltzer, 1989)</p>	<p>SMEs lack the human and financial resources and capabilities of large firms (Ettlie, 1983; March, 1981), thereby facing limitations in purchasing and implementing new systems Lack of financial resources makes it critical for SMEs to pick their strategies carefully (Lynn <i>et al.</i>, 1999) Many SMEs use computers only to send e-mails, and set simple web sites (DTI, 2003). Slow rollout of broadband has also frustrated many SMEs (Lifting, 2002)</p>

advantage in SMEs (Hoffman and Novak, 1996). Verity and Hof's (1994) study suggests that it may be nearly 25 per cent cheaper to conduct direct marketing through the internet than through conventional channels. In contrast, DTI (2003) and Oftel (2003) statistics show that, although the cost of being connected to the Internet has reduced dramatically in the past decade, it is still not used in a more sophisticated way by SMEs.

Fann and Smeltzer (1989) in their study of market information in SMEs concluded that as data become more abundant and less costly, SMEs will begin to use this information in more sophisticated ways. However, almost a decade later Small Business Statistics (DTI, 2003) show that although 65 per cent of businesses have internet access only 34 per cent of businesses with internet access use a broadband connection (Oftel, 2003). SMEs are not to be blamed for this as it is widely believed that the slow rollout of broadband in the UK has frustrated many of them (Lifting, 2002). The level of broadband connection varies from 5 per cent for the smallest companies to 50 per cent for those with 1,000 or more employees (Office for National Statistics, 2000).

Not only have SMEs limited financial resources in terms of acquiring suitable technology, but they also lack human capabilities, which contribute to a general lack of skills and knowledge within the organisation to cope with new ideas, concepts and technologies. Bharadway (2000) argues that ICT skills of SMEs owners/managers play a vital role and that IT-capable firms outperform others on profit and cost-based performance measures. Poon and Swatman (1997) also suggest that the reactive or proactive approaches of SMEs owner-managers to rapid technological changes in the marketplace will determine the level of ICT adoption and implementation. Managerial commitment and the perceptions of ICT benefits are seen as major factors in this process (Poon and Swatman, 1997).

#### *Government involvement with SMEs*

The UK was one of the first countries in the world to liberalise telecommunications (DoH, 2000). This is partly because the UK Government believes that the internet is a "good" thing for all and especially for SMEs (Martin and Matlay, 2001). Therefore, all government policies are created on the basis of that belief. While Martin and Matlay (2001) contend that such wide-ranging beliefs over the internet have yet to be supported by any empirical evidence, the UK government has ambitions to make UK SMEs leaders within the G8 group of countries (Canada, France, Germany, Japan, Italy, Russia, UK and USA) where technology is concerned. In order to succeed in its ambition and get UK businesses online with the added aim of increasing the e-business readiness of SMEs, the UK Government has spent more than any other country (£67 m) on a comprehensive programme in the past three years (DTI, 2003). The government's intention is to create an environment within the UK that is the most favourable in the world for electronic trading. However, in terms of business internet access, the UK is still the second most expensive of the G8 group of countries (DTI, 2003). This is despite the fact that the cost of the internet technologies has decreased dramatically over the past decade (DTI, 2003; Oftel, 2003).

The UK Government is aware that it is not possible to create the knowledge economy without the knowledge society. In that respect over the last 20 years, it is estimated that there have been approximately 200 initiatives to support the improved competitiveness of SMEs and to improve skills of their workforce. Yet the take-up rate



has been low (Jones and Tilley, 2003). Even support programmes such as training and business health checks have rarely achieved more than 10 per cent take-up, and often take-up is much lower (Curran, 1999). The challenge for government is to convince generally reluctant SME owners/managers of the need to take external advice and persuade them to actually take that advice (Hankinson *et al.*, 1997; Hankinson, 2000; Docherty and Simpson, 2003). However, many owners/managers have fervent beliefs about the unique nature of their business that leads them to be doubtful about new advice (Mole, 2002; Docherty and Simpson, 2003).

#### *Business models*

Owing to an increased academic interest created by the expansion of the internet technology, numerous models that address IT adoption have been created, all of which support and encourage SMEs to implement and use the internet technology as the basis of their businesses. In this study, we emphasise those early business models, which originally initiated the explosion of numerous e-models. These are:

- MIT90 Framework – general business model, later used for developing more sophisticated e-business models (Scott Morton, 1995).
- Afuah's and Tucci's (2001) internet business models and strategies provide a general framework for developing an internet-based business model which offers theory-grounded arguments about traditional organisations and new internet start-ups using various frameworks. However, these business models are concerned with revenue generation and not with how to gain a competitive advantage.
- Venkatraman's (1994) evolutionary process model, later used for developing e-commerce models (Poon and Swatman, 1999).
- DTT's (2000) e-adoption ladder, originally developed for e-commerce and later used for the development of the "transporter model" by Levy and Powell (2003).
- Owner/managers characteristics, used for developing different models and strategies in organisations based on human resources and their personal characteristics (Southern and Tilley, 2000; Van Akkeren and Cavaye, 1999; Blackburn and McLure, 1998) (Table II).

As interest in e-models and frameworks grows (including academic interest and government involvement) there is an increasing interest in applying these models to SMEs. However, these e-models (although not perfect) highlight the need for further empirical research in this sector and have subsequently created grounds for this study.

#### *E-business models*

The emergence, growth, globalisation and interest in the internet technology have resulted in the creation of various general business models and e-business models relating to internet strategies. Table III shows some examples of e-business models and business model analysis, and it exemplifies the various phases involved in moving towards greater sophistication, with respect to the use and management of information technology. There are many e-business models, however, not all of them are suitable

Model	Author(s)	Purpose
The technology acceptance model	Davis (1989)	Addresses IT adoption, implementation and diffusion in terms of perceived ease of use and perceived usefulness based on behavioural intentions
Typical "Linear" model of transforming technology through social process and a new "Cyclical" model.	Scarborough and Corbett (1992)	This typical linear model implies that technological necessity operates by welding science, technology, markets and organisations together into an object and an interlocking causal chain. Scarborough argues for a rather different model, viewing invention, use and exchange of technology in terms of subjective actions and loosely coupled forms of social organisation, giving rise to a cyclical and reciprocal process rather than a linear process
Five levels of IT – enabled business transformation – model	Venkatraman (1994)	This well accepted model suggests that there are five distinct levels of business transformation enabled by traditional IT systems. Out of five levels, Venkatraman suggests that first two levels are within the organisation (evolutionary level), and the remaining three are external (revolutionary levels). Venkatraman's argument is that the benefits an organisation can realise from its IT investments will increase with these increased levels of integration. However, with these increased levels of organisation there will be need for greater changes within the organisation. Although this model gives a great freedom to organisations in terms of when evolutionary level becomes revolutionary, it is still viewed as hierarchical

*(continued)*

**Table II.**  
Examples of some e-commerce models

Table II.

Model	Author(s)	Purpose
Typology of owner-manager model	Blackburn and McLure (1998)	This model is based on three different types of owner/managers in SMEs: enthusiasts, pragmatists and artisans. The model is founded on owner/managers attitudes to ICT, level of ICT skills and management orientation
Model of internet commerce adoption – MICA.	Cooper and Burgess (1998)	Model attempts to describe evolutionary process of e-commerce adoption. They propose three stages – promotion, provision, processing. This model follows Darwinian evolution paradigm, i.e. the organism evolves from a simple structure to more complicated ones with better ability to adapt to the environment. The organisation starts with a simple and static internet presence, then the organisation moves gradually to more complicated and integrated functions
Owner/manager characteristics	Van Akkeren and Cavaye (1999)	Owner/manager characteristics are defined as personal characteristics of people who make the major decisions and determine strategies in SMEs. These characteristics have been perceived in the literature as crucial in adopting internet strategies
The internet commerce maturity model	Poon and Swatman (1999)	This model is based on Venkatraman's model. The authors suggest that there are three hierarchical stages (not five) of e-commerce adoption in SMEs. They believe that the first level is to develop internet services (e-mail, web sites) to communicate with suppliers and customers. Next step is to undertake limited degree of integration with their existing internal systems and only at highest level full integration is achieved. This suggestion turns Venkatraman's model inside-out when applied to e-commerce. Knowledge and experience is gained at each level of integration

(continued)

Model	Author(s)	Purpose
Department of Trade and Industry (DTI) SMEs e-business adoption ladder.	DTI (2000)	The e-adoption ladder is a linear model which implies sequential adoption of ICT from e-mail and web site use through e-commerce, e-business and to "transformed organisations"
Model based on typology of the whole firm	Southern and Tilley (2000)	This model builds upon Blackburn and McLiure (1998) model of typology of owner/managers. They used interview-based methods, to develop a model which is based on the typology of the whole firm. It is non-hierarchical approach, which suggests the relationship between types of ICT use is non-linear, dynamic and relative with fuzzy boundaries. Their typology is: (1) Low small firm users of ICTs; (2) Medium small firm users of ICTs; (3) High small firm users of ICTs
e-SMEs business and e-commerce development model – crossing two digital divides	Local Futures Group (2001)	Linear model in terms of crossing two digital divides: (1) The first divide requires basic ICT skills to operate e-mail and simple brochure web site; (2) The second divide requires more advanced technology and ICT skills (including R&D), and a wide range of specialised knowledge (for example, management development and strategy, marketing)
The transporter model	Levy and Powell (2003)	This model is based on DTI e-adoption ladder. This is a strategic model which suggests that criteria for adoption are dependent upon the owner's attitude to growth. The transporter model identifies four roles for internet technologies in SMEs – brochureware, support, opportunity and development.

Table II.

Model	Author(s)	Purpose
MIT90 Framework – IT-based capabilities of modern organisation	Scott Morton (1995)	An organisation can be viewed as being composed of five interrelated components: management processes, structure, strategy, technology, individuals and roles. Because they closely interact with one another, changes to any of the components will require changes to the others to bring their objectives and activities back into alignment. This framework was originally developed to guide organisations through their adoption of IT as an organisational and strategic resource from their computer automated environments (i.e. data processing, automated reporting, computer integrated manufacturing, etc.). This was done in the context of the traditional business model. It is looking at micro factors affecting the adoption of e-business and not individual factors. The key underlining assumption in the paradigm shift included the adoption of a new organisational strategy and IT. For the organisation to benefit from the shift, all parts must be designed to work together. However, MIT90 framework does not suggest its applicability to e-business (because it is a business model with a focus on IT revolution) or indicate the sequence of events that leads to success
Framework for transitioning to an e-business model	Chen and Ching (2002)	This model is based on MIT90 framework and its purpose is to guide the successful transition from a traditional to an e-business model. In this model it is suggested that all aspects of organisational operations must be synchronised and co-aligned. The authors suggest that the organisation needs to first change its strategy and technology. The authors believe that this will determine the structure, management process, individuals and roles. They draw upon resource-based theory which will bring sustained competitive advantage to the organisation. However, this model does not take into consideration owner/managers attitude towards change, organisational readiness and stages of adoption, external pressure, size and age, IT skills and knowledge, etc.

(continued)

**Table III.**  
Examples of some e-business models

Model	Author(s)	Purpose
A conceptual model of e-business development	Fillis <i>et al.</i> (2003)	This conceptual model attempts to consider how a range of internal and external factors influence attitudes towards e-business, as well as its implementation as part of the company's business strategy. Factors considered in the model are: macro-factors, industry/sectoral factors and firm/managerial factors. Many important factors that might influence successful adoption of e-business strategy have been taken into consideration however this is a theoretical model and has not yet been tested. In addition this model does not suggest when structural changes will occur and what will happen at the macro level, industry level and firm's level. In reality it only presents barriers and benefits of e-business adoption rather than the sequence of events that could lead to success

Table III.

for this study. To make the classification of these models easier, we identified three different kinds of e-business model:

- (1) supply-chain management-based models;
- (2) operations based models; and
- (3) strategic models.

Since, this paper focuses on the area of strategic management we aimed our research towards the strategic approach to e-business models. These models, presented in Table III, propose a fairly solid base for the adoption and integration of e-business strategy in an organisation. However, these existing models are lacking the unity that brings the industry, IT, an organisation and human factors together. For example, Afuah and Tucci's (2001) framework offers strategies and tactics for this new electronic era and is valuable for both researchers and managers trying to make sense of this new world. Whereas, Jelassi and Enders (2005) take a more classical approach, applying the ideas of Michael Porter. None of these approaches appear give a complete picture of what is actually needed to create a competitive advantage in SMEs using e-business. This suggests that a new e-business model is needed which supports the following goals: customer focus, the internet technology as a core competence, organisational readiness, lower cost and greater efficiency. Only by integrating the internet into an overall strategy will this powerful new technology become an equally powerful force for competitive advantage (Porter, 2001). The main problem to date is that this has not been done to any meaningful extent (Wagner *et al.*, 2003).

#### *Competitiveness in a new e-economy*

The term "competitive advantage" is one of the most enduring themes in the business strategy literature and its theories have been well established

(Porter, 1985 and 1986; Ansoff, 1965; Barney, 1991). Porter and Vn der Linde (1995, p. 16) points out that the idea of competitive advantage underpins many business books. He defined it as the "... value a firm is able to create for its buyers that exceeds the firm's cost of creating it" (Porter, 1985, p. 3). Based on Porter's definition, that competitive advantage is the result of the strategies adopted by a firm with a purpose to add value to customers. This will consequently position a firm advantageously and enable it to compete over a period of time. The overall argument is that a company has a "competitive advantage" when its profit rate is higher than the average for its industry, and it has a "sustained competitive advantage" when it is able to maintain this profit rate over a number of years. The basic condition to gain a competitive advantage which must be satisfied is: the amount of value customers place on the company's goods or services must exceed the cost of production. In other words, the concept of value creation lies at the heart of competitive advantage (Porter, 1985).

However, Porter's (1985) work on corporate strategy is based on large organisations rather than SMEs and therefore it can be argued that SMEs are unlikely to have sophisticated divisionalised structures to create competitive advantage (Lynn *et al.*, 1999; Lifting, 2002; DTI, 2003). As a result, SMEs generally occupy niche markets which larger firms do not consider as significant areas of business activity.

Large firms have traditionally commanded a competitive advantage in the marketplace by being able to use their financial strength to perform large-scale market research studies, to design and implement wide reaching advertising campaigns and to establish computer and information systems to communicate with their staff and suppliers (Lynn *et al.*, 1999). Large firms also enjoy advantages such as economies of scale, experience, brand name recognition and market power that typically elude SMEs (Hambrick *et al.*, 1982; Woo and Cooper, 1981, 1982).

The ability of SMEs to gain a competitive advantage is thought to be related to issues of marketing, market research, marketing strategy, new product development, the technologies and processes and, the manufacturing and operations strategy adopted (Freel, 2000; Hart and Tzokas, 1999; Huang and Brown, 1999; O'Brien, 1998). However, in contrast to large firms, SMEs face considerable difficulties and problems in these areas, including understanding and applying marketing concepts and techniques (O'Brien, 1998), particularly in the area of promotion and market research (Huang and Brown, 1999). In addition, Freel (2000) pointed out that studies of SMEs have consistently raised the issue of poor management skills and, more precisely, that poor marketing skills have been a barrier to product innovation. Hannon and Atherton (1998) have also noted that the level of strategic awareness of owners/managers appears to be strongly influenced by the personal competence and attitudes of owners/managers.

Interestingly, the gap between large organisations and SMEs is closing and the pattern of winning in the market space is changing due to technological advances. Competitive advantage, which once belonged exclusively to the large firms, is now becoming available to SMEs through geographically open boundaries created by the internet. In today's virtual environment firms (large or small) that can understand their customers' problems, needs and desires, which can provide solutions to these problems, which can communicate those solutions to their target audiences and which can provide easy customer ordering will be in a position to win in the marketplace (Lynn *et al.*, 1999). We are entering the era of the business web (b-web) which

represents any system of suppliers, distributors, service providers, infrastructure providers, and customers that uses the internet as the basis for business communications and transactions (Afuah and Tucci, 2001). This new form of value creation is becoming the basis for competitive strategy, which could be very beneficial for SMEs.

Expansion of the internet led to the creation of new types of businesses known as “high-tech start ups”. These contemporary organisations with new business structures have seized on the opportunities available simply by using the internet technologies. These new organisations – such as Amazon.com, AOL.com, Ebay.com, etc. – are reshaping industries and they are creating significant strategic advantages for their firms (Fahy and Hooley, 2002). The internet is the core competence of their business and determines how they are structured and how they operate.

Looking at the financial strengths of large organisations and the internet-based strategies used by the new “start-ups” to create competitive advantage one can argue that SMEs could benefit from the internet by simply applying both of the above techniques. Firstly, SMEs need to start building up on their existing technologies and exploit the internet’s speed, flexibility and sophistication for a relatively cheap price. Since, the cost of the internet technologies has decreased dramatically over the past decade it appears that SMEs would be able to establish a local presence with a global reach on a very limited budget by simply using:

- starting from using the internet for global advertising and market research;
- low-cost electronic mail to communicate with customers; and
- mobile technologies such as cellular telephones and Personal Digital Assistants (PDAs) for order-taking and field sales.

This could in return make SMEs more viable in the area of marketing, market research and new product development, which would eventually make room for the implementation of much more sophisticated applications that are required in e-business strategies (Van Hooft and Stegwee, 2001). Once the sufficient technological infrastructure is in place SMEs could use the internet as the core competence in a similar way to many new “start ups”.

## Results and discussion

### *Detailed case study 1 – Gripple Ltd*

Gripple Ltd is a Sheffield-based manufacturing company that employs 147 people and has an annual sales turnover of £14.6m. The “Gripple” is a device invented by the chairman of the company and is recognized as the world’s most innovative way of joining, tensioning, terminating and suspending wire and wire rope. The company is strategically driven and highly innovative in applying latest manufacturing technology to new products. Over the years, innovation through product development has remained the core of the company’s successful operation. Owing to strategic and operational positioning, the company invested in technology right from the beginning. Now, the company is Enterprise Resource Planning/Just-in-time (ERP/JIT) system, and has a very strong Research and Development (R&D) department. Their latest technological investment is in a cutting edge “Loadhog” (a re-usable device for securing boxes to a pallet instead of shrink wrap plastic). This forward thinking strategy and investment in the appropriate IT infrastructure has



opened a wide global market to this company. In terms of ICT, the company is successfully using e-mails, as an efficient internal and external communication tool, a web site, which positions them in the worldwide market, and e-commerce, where they are able to order and pay online and maximise accessibility and speed. Nevertheless, the company is disadvantaged in the area of supply chain integration with other companies whose owners/managers are lacking the same enthusiasm about IT investment and are preventing Gripple from full e-business integration. For example, the company's managers still need to use a telephone and fax machine to make sure that final material orders and deliveries are taking place as planned. This is due to a high percentage of human errors experienced in the past and the lack of appropriate IT infrastructure in their suppliers' companies. To complete the chain Gripple Ltd may need to help their business partners (suppliers/customers) by defining hardware/software/internet service provider configurations, which would consequently emphasize the importance of close relationships between supply chain partners as a prerequisite to adopting e-business. In particular, the company may need to initiate the building of an electronic Business2Business and Business2Customers relationship. These can be realised by using an extranet that enables the company to share part of the business's information or operations with suppliers, vendors, partners, customers, or other businesses. As a result, this will enable business partners to develop a real appreciation of the power of the internet.

#### *Detailed case study 2 – SMP Europe*

SMP Europe is a Yorkshire-based motor vehicle parts manufacturing company. The company was formed in 1967, employs 250 people and has an annual sales turnover of £15m. For many years the company went from strength to strength and expanded gradually. However, in the early 1990s business started to decline due to the fact that the company's main products were copies of original vehicle parts. After that the company went from winning to losing rather quickly. The management control of the company was poor, with low efficiency and high production costs. This was partially caused by the fact that the company ignored rapid advances in technology and they did not have the ability to generate new value through innovation. What is more, lack of investment in better technology and the declining stage of the industry life cycle (producing copies of original vehicle parts) forced the owner of the company into a joint venture with a firm in the USA. However, in the late 1990s the company took back a controlling interest in the firm because the owner of the company realised that their future is in innovation rather than in copies of original parts. As a result, the owner/manager made a decision to acquire another organisation – a manufacturer with an innovative marketing approach. In 2002 they invested £1m in a new IT infrastructure, staff training, a new telephone system, a new ERP system and a new customer database. However, due to a previously poor IT infrastructure and legacy systems the company has taken 18 months to come back to where they started from before the upgrade. In terms of ICT the company is successfully using e-mails and the web site as means of communication, internally and externally. In the future, the company plans to engage more in e-commerce transactions that could maximise accessibility and speed. It is only a start for the company in terms of e-business applications, but they are willing to learn from their mistakes and try to keep up with the technological advances in the future.

*Analysis of two detailed case studies*

The advances in IT are anticipated to affect both organisations considerably and in a very different way. Although neither of the company's is using e-business, as we defined it previously (Van Hooft and Stegwee, 2001), Gripple Ltd is more advanced in the use of the internet technology in general. For both companies change becomes imperative but in particular for SMP Europe. This change involves a new underlying philosophy behind the firm's planning and development strategies as promoted by DTI (2003). Furthermore, such an adaptation to a new e-business infrastructure involves massive changes that affect core elements of an organisation, including mission statements, vision, business strategies, goals, culture, technology, training and policies (Mukherji and Mukherji, 1998). For example, in the interview with SMP Europe it was confirmed that the changes and adaptation were very slow and consequently they resulted in stagnation of the business and loss of the ability to generate new value through innovation. Moreover, after initial investment in the new technology, the company is still employing low skilled staff and still not using newly acquired IT infrastructure to its full potential as argued in studies of Poon and Swatman (1997), Hannon and Atherton (1998) and Bharadway (2000). It seems that both management and employees of SMP Europe should play an active role in implementing these changes. It should be noted that SMP Europe is a very good example that compliments to the study of Kalakota and Robinson (2001) and shows how managers of profitable companies must anticipate the need for self-transformation and change when there is an opportunity and not when faced with difficulties.

Unlike SMP Europe, Gripple Ltd has a partially integrated system and it is now waiting for some suppliers and customers to participate in technological advances to complete the integration of their supply chain. However, Gripple Ltd needs another set of flexible and responsive strategies that will deal with those organisations in their supply chain which are reluctant to restructure, reengineer and reinvent themselves. The point here is that the internet technology and e-business strategies should be treated as simply another technique for reinventing or rather rejuvenating the business (Kalakota and Robinson, 2001). This study also shows that not only do companies need to anticipate and accept changes themselves but they need to persuade their business partners (suppliers and customers) to appreciate the power of the internet.

In addition to the appreciation of technological advances and staff involvement, companies need to look out for external support, which is provided by the UK Government (DTI, 2003). For example, Gripple Ltd is very much aware of the government initiatives in relation to improving SMEs technological standards. In that respect, Gripple Ltd is involved in many initiatives run by the government and they use the support and help available to their full advantage. Although government policy has been formulated to promote ICT for all SMEs (DTI, 2003; DoH, 2000), our experience is that SMP Europe does not use any government-related agencies. It can be argued that if they can change their attitudes towards these initiatives they could start taking advantage of them.

Even though for Gripple Ltd the e-business planning process appears to be relatively strait forward, experience of SMP Europe demonstrates some of the problems associated with the process of the e-business planning. Nevertheless, to implement an e-business strategy (described in Van Hooft and Stegwee, 2001) correctly requires an ongoing commitment of time and energy. Our research shows that, despite

the difficulties, both companies are willing to make that commitment at this moment in time. It should be noted that although they represent traditional companies the owners/managers' belief is that the internet technology has changed and will continue to change the way they do business.

*Summary of other case studies*

In the interviews with the seven other SMEs owner-managers it was confirmed that they do not like to be pushed by anyone, especially the Government and DTI (2003), in terms of their technological and organisational readiness. Our interviews revealed that companies would like to take a step at a time and incorporate e-business in their existing strategies gradually and when they feel they are ready. These findings support our earlier recommendation that a new e-business model is needed that will help SMEs in this transition period.

All seven owners/managers interviewed stated that they would like to change their business strategies but stay entangled in the old way of doing things. The reasons cited that these owners/managers: are lacking appropriate skills and knowledge and have not enough information regarding where to seek help. It can be argued that these findings support the challenge for Government to convince generally reluctant SME owners/managers of need to take external advice (Hankinson, 2000; Hankinson *et al.*, 1997; Docherty and Simpson, 2003).

In addition, issues regarding government initiatives, skills, IT experience and SMEs willingness to upgrade their existing technologies need to be emphasised. Although government policy has been formulated to promote information technology and communications for all SMEs (DTI, 2003) our experience is that all seven organisations had never heard of UK online for business. The following statements collected from the interviewed SMEs illustrate this point:

I've never heard about UK online for business. Government should find better ways of communicating the information to local businesses, other than leaflets which we consider as junk mail (Sheffield Motor Company Ltd).

Not heard about UK online for business. Government never listen to what practitioners have to say. They do their business we do ours. We would like to change our strategy but don't know how (Lovebytes Ltd).

I don't know who UK online for business is. I am unaware of any help promoted by UK government. I would really welcome any Government initiative to help me, mainly financially to set up a web site (Aleksandria Sciences Ltd).

We used some government agencies but they are not useful. I tried to find some information about my business and the government representatives were very unhelpful. They send me to find information myself. They don't communicate their ideas and plans to us and they don't talk to us (Cave Studios Ltd).

Furthermore, this research confirms previous findings of the DTI (2003) that companies below £50 k turnover found the cost of even basic IT equipment impossible to afford. The lack of broadband connections is reported to have frustrated small businesses; however, our research did not find any evidence to support these assertions (Lifting, 2002). Nevertheless, skills and organisational capabilities have come out as a potential problematic issue for SMEs. We found enough evidence to support

Local Futures Group's (2001) findings that if SMEs increase the level of technical skills across the board that will encourage further technological implementations. The following quote from one SMEs interviewee illustrates this:

We could do business without the Internet technology but we would like to get more out of it. It is expensive. We have some applications but they are not used properly, it is skill problem (Toni and Guy).

Positive experience with IT has been noticed throughout the case studies with only one exception. One SME representative (Occidental Ltd) disclosed that the organisation raced onto the internet at an early stage only to discover quite painfully, that the internet and technology did not spell automatic success. The company has been disadvantaged by a bad experience. However, the owner is very aware of the advances in the internet technology and is preparing a plan to implement some of the technological applications, which will be built on at a later stage.

Our research identifies that in order to implement e-business most of the companies interviewed are facing a complete overhaul of their existing strategies for which they are not ready at the moment. Some simply because of unsuitability of the industry sector they trade in and others because they are not ready to take the next step. This study on the whole suggests that a new conceptual model is needed which could be used as a general tool for creating competitive advantage in SMEs, providing that owners/managers are receptive towards the usefulness of an e-business strategy and its implementation. This complements to the study of Bharadway (2000) who argues that the ICT skills of SMEs owners/managers plays a vital role and that IT capable firms outperform others on profit and cost-based performance measures. Although additional research in this area is needed, there is also some evidence that supports recent studies of Kalakota and Robinson (2001) that global reforms, technological transformations and socio-economic changes will continue to affect SMEs and the UK economy as a whole. In that respect this study confirms Coltman *et al.* (2001) findings which argue that traditional firms have found applications for internet technologies. Our research shows that technology has indeed transformed the traditional business environment and impacts on how businesses perform.

On the whole, our findings open an area for further studies and discussion as we could not find measurable evidence that e-business can create a competitive advantage in SMEs. However, our two in-depth case studies show that there may be a possibility that when companies integrate the internet into their overall strategy the new technology will lead to a competitive advantage. On the other hand, the remaining seven case studies show that although they use some form of technology to run their businesses they are far from creating a competitive advantage from it. At this stage, our advice to SMEs would be: if organisations are to create competitive advantage and win e-customers, it is absolutely essential for businesses to have a sound and well-resourced integration plan of new technologies.

### Prototype of a new e-business model

Although limited, our study clearly shows that SMEs need to create and implement a plan that allows them to make the transition from an old system to a new, e-business organisation. To help SMEs manage this transition period we propose a prototype of a new e-business model named CATE-b as shown in Figure 1. We call it a "prototype"

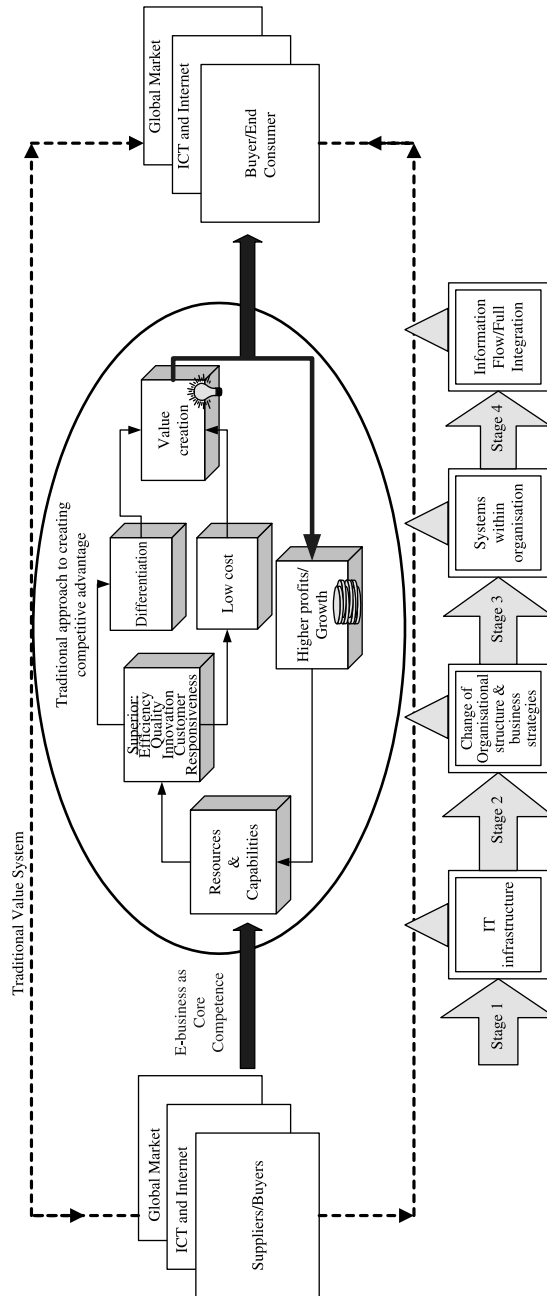


Figure 1.  
CATE-b prototype of  
e-business integration

because it is based on limited evidence and would require further development, refinement and verification. Nevertheless, it is important to stress that this prototype model has a sound basis in the comprehensive literature review and was complimented by a limited number of case studies. The proposed prototype is regarded as an adaptable solution where a company with an old legacy system uses existing IT applications and builds upon them at their own pace. This way companies with or without external financial support (e.g. provided by the government) can minimise risks associated with developing a vast IT enterprise requiring expensive planning and investment. Based on the extensive literature review and limited exploratory case studies, this solution is considered suitable for SMEs with a traditional business structure. The CATE-b prototype consists of three elements (Figure 1):

- (1) *Traditional approach to creating competitive advantage.* Theoretical framework based on Porter's generic strategy approach.
- (2) *Value system.* Theoretical framework based on the Porter's traditional value chain and Venkatraman's reversed value chain.
- (3) *Four stages of integration.* Theoretical framework combined and enhanced with findings from this limited case study research.

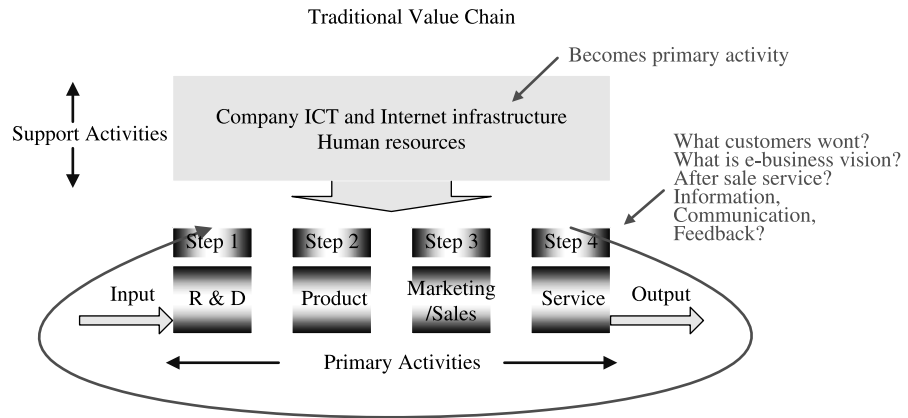
The above three elements translate into an enterprise that is both efficient and flexible, allowing the company to adapt, change, grow, and innovate.

#### *Traditional approach to competitive advantage*

As a starting point, in this study we followed the classical approach based on the work of Porter (1985). The development of the CATE-b prototype was aided by Porter's generic strategy approach. Porter (1985) argues that a firm positions itself by leveraging its strengths, which ultimately fall into categories of either cost advantage or differentiation (Figure 1). As this is a well-known way of creating competitive advantage, especially in large organisations, our model allows SMEs to keep their traditional organisational set ups at the beginning of the transition period. Gradually and with the growth of the use of the internet technology, companies will be able to change their strategies. The desire for this gradual transformation was confirmed in the interviews with the seven SMEs owners/managers.

#### *Value system*

The basic tool for understanding the links between various activities within a firm and their contribution to competitive advantage is the "value chain" (Porter, 1980). The value chain provides a systematic way of "disaggregating" the firm into its relevant units so that managers are better able to understand the nature of costs and potential sources of differentiation (Jones and Tilley, 2003). The CATE-b prototype model addresses the firm's value chain that links to the value chains of upstream suppliers and downstream buyers. The result is a larger stream of activities known as the value system as introduced by Porter in 1985 (Figure 2). This is because the development of competitive advantage depends not only on the firm's specific value chain, but also on the value system of which the firm is a part (Porter, 1985). In our interviews with the two manufacturing companies it was confirmed that the value system plays a vital role and that the companies' value systems are enhanced by the speed and efficiency created by utilising the internet technology.



**Figure 2.**  
Traditional value chain  
design

**Source:** Adapted from Hilland Jones (1998)

In the traditional business model (Figure 2), managers concentrate on being effective and competitive by initiating R&D (Step 1), putting well-understood products (Step 2) on the market (Step 3) and offering service to buyers (Step 4). These four steps form primary activities in a traditional value chain. However, our interviews identified two critical areas in a traditional value chain as shown in Figure 2. One is in a domain of primary activities where services and buyers identified as Step 4 in the traditional value chain replaces R&D and becomes step one. The traditional value chain is reversed at this point (Venkatraman, 1994). This is confirmed by the study of Venkatraman (1994) who argued that to invent value in the new environment managers must reverse the traditional value chain thinking characteristics in which businesses define themselves in terms of the products they produce. The other critical area is related to the support activities. Based on our preliminary findings and in order for SMEs to integrate the internet technology into their value system, we propose that their supporting activities become the primary activities (Figure 2). As a result, the company's technological infrastructure and human resources will form the core of e-business planning (Davidov and Malone, 1992; Durkin and McGowan, 2001) as shown in Figure 1. This will enable SMEs to make the relationship between resources and opportunities offered inside and outside the organisation possible, will be customer focused (Fahy and Hooley, 2002; Brorson, 1998) and will create value through innovation and integration.

#### *Stages of integration*

As the starting point of SMEs e-business integration we propose four building stages:

- (1) *Implementation of appropriate IT infrastructure.* This is an IT infrastructure integration, which is seen as a starting element of an e-business implementation strategy. An SME needs to provide and invest in the hardware and software required for the business to work. It seems clear that the first step in a successful e-business strategy is having the company's own systems in order (Feller, 2000; Porter, 2001). Our study shows that companies who are highly IT capable and employ more skilled staff outperformed others in terms of profit (Table IV).

Case company	Grippple Ltd	SMP Europe	Sheffield Motor Company Ltd	Aleksandria Sciences Ltd	Moving Image Research	Lovebytes Ltd	Occidental Ltd	Tony & Guy Ltd	Cave Studios Ltd
Start of business/first computer	1988/1988	1967 and 1996/1978	1998/2001	1997/1997	2002/2002	1994/1994	1997 and 2000/1997	1996/1999	1979/1985
Sales turnover	£14.6 m	£15 m	£1 m	40 k	N/A	200 k	250 k	700 k	350 k
No of employees	147	250	5	1	6	2	7	25	2
Industry sector	Manufacturing	Automotive manufacturer	Motor trade/	Consultancy service	Technology	Art service	Dentistry	Service – hair dresser franchised studio	Music – service broker/growth
Organisational structure <sup>a</sup>	Flat	Flat	Flat	Flat	Tall	Flat	Flat	Hierarchical	Flat
Stages of the industry cycle	Embryonic and growth – entering new markets all the time	Embryonic, growth and declining – have different products	Declining	Embryonic	Embryonic – new high-tech start up (niche market)	Slow growth	Growth	Growth	Slow growth(niche market)
Markets	Global	Global	UK	Global	Global	UK	UK	UK	Global
IT infrastructure	High – early adopters	High – early adopters	Low – laggards	Low – laggards	High – innovators	Medium – early majority	Low – late majority	Low – late majority	Medium – early adopters

(continued)

Table IV.  
Summary of SME case study



Table IV.

Case company	Gripple Ltd	SMP Europe	Sheffield Motor Company Ltd	Aleksandria Sciences Ltd	Moving Image Research	Lovebytes Ltd	Occidental Ltd	Tony & Guy	Cave Studios Ltd
E-business integration	Medium/high – almost fully integrated	Law/medium – some internal integration	None – use only email	None – use only email	Unspecified	None – use email and have webpage	None – use only emails	None – use only emails	None – use emails and have webpage
Core competence R&D	Innovation	Innovation and copies	Customer responsiveness	Customer responsiveness	Innovation	Customer responsiveness	Customer responsiveness	Customer responsiveness	Customer responsiveness
	High – product innovation	Medium – product imitation and innovation	None	None	High – product innovation	None	None	None	None
Use of government initiatives	High	Low	None	None	None	None	Low	Low	Low
IT experience	Positive	Positive	Positive	Positive	Positive	Positive	Negative	Positive	Positive

**Notes:** <sup>a</sup>Hierarchical structure of organisation – clean line of authority and responsibility that is necessary for the effective operation of organisations; Flat: broader spans of control and few levels of authority result in a flat hierarchical structure; Tall: narrower spans of control and more levels of authority result in a taller hierarchical structure

- (2) *Changed organisational structure and business strategies.* This is looking at structural change within organisations. At this stage a company accepts that the internet technology will become their integral part and the value chain is reversed. This is seen as an important element of sustaining value creation by firms in the future. Organisations need an integrated and coordinated approach towards knowledge, technology and relationship management (Walters *et al.*, 2002a, b). In our study, we identified that companies which refuse to change and adapt to the new environment when necessary experience many difficulties. These are related to the overall success, profit and the growth of the company as shown in Table IV.
- (3) *Integration within an organisation.* This is a complete internal integration. The business goal is to focus on cost reduction and internal efficiency (Cheng *et al.*, 2001). Our research shows that SMEs who are able to integrate internally are more successful and employ skilled and knowledgeable staff.
- (4) *Full integration with free information flow between suppliers, organisation and customers.* This is the final and full integration with a free information flow, where the business goal is to create market value and competitive advantage by using the internet technology. This stage enables supply chain integration and more effective in-sourcing and outsourcing. It also allows for sophisticated online business to interrelate internally as well as externally (Van Hoof and Stegwee, 2001; DTI, 2000). SMEs presented in this study have not yet reached this stage of full integration. However, this stage is seen as an essential part of implementing an e-business strategy.

It is important to stress that the above four basic elements of e-business integration should not be seen as a linear process but rather as the “building blocks” of various factors helping SMEs to take a step at a time and when ready. The proposed building stages of integration support the Government’s e-business adoption ladder model (Kaplan and Norton, 2003) and contradict Levy and Powell’s (2003) statement that the stage model is inappropriate and misguided. In addition, all four elements of e-business integration have been seen as key enablers of a full e-organisational integration that will allow free information flow between suppliers, the organisation and customers. In exchange this would create profitable growth that provides a customer tailored product and service, and add superior value to the firm.

### Conclusions

E-business has received a lot of attention in the last few years. By using an exploratory multiple case study approach, we highlighted the issues of internet and e-business uptake among a group of selected UK SMEs. The results of our study indicate that SMEs use some form of internet technology in running their day-to-day businesses but most of them are not creating value by using e-business. Even though there was no firm evidence that these SMEs could create a competitive advantage by using e-business, this study unveiled some evidence that demonstrates the potential for creating a competitive advantage in SMEs by using e-business. However, existing models and frameworks seem insufficient for SMEs adopting e-business (Afuah and Tucci, 2003; Jelassi and Enders, 2005). Our research showed that the challenges for SMEs are in realising the importance of the internet technology, its early adoption and effective use. The literature reviewed and our exploratory study showed that there are no existing frameworks or models which address

big differences between SMEs in the way they adopt and use various internet technologies. Because of these differences and the limitations of existing business models we believe that a new e-business model is needed to help SMEs make the most of the opportunities offered by e-business and the internet. In that respect a prototype of the CATE-b model has been constructed. This prototype model could help SMEs to manage the transition period from an old system to a new integrated organisation. This prototype of an e-business model emphasises the close relationship between business partners (suppliers and customers) that needs to be established in order to attain a competitive advantage.

However, the proposed CATE-b prototype model has yet to be tested, refined and improved. The main emphasis of the prototype model is that SMEs should use the advances of the geographically open boundaries and the power of the internet to gain a competitive advantage in those areas that once belonged to large firms with significantly greater financial resources. The technology is now so cheap and cost effective that opportunities for SMEs to compete effectively against larger firms are greater than ever before, despite the fact that the UK is the second most expensive country within the G8 group for internet access (DTI, 2003). Therefore, SMEs should try to use these technological advances to position themselves in those areas previously thought to be too difficult to enter. These areas include innovation, marketing, efficiency improvements, better quality and customer responsiveness. This new e-business prototype model offers greater strategic advances and opens markets to SMEs in the area where traditional business models and methods do not.

In order for the prototype model to work we found in this exploratory study that SMEs need external support (i.e. UK Government) and highly skilled staff. However, the reality is that SMEs are facing difficulties in this particular area. Although the UK Government has many supporting mechanisms in place the main criticism from SMEs is that it still needs to improve the communication networks that will help their businesses in the future. Nevertheless, SMEs owners/managers are aware that they also need to be a little more proactive and take advantage of the government initiatives that already exist. Individual organisations should prepare themselves for an inevitable change and anticipate the equal importance of people management and technology management. The speed with which SMEs will adopt e-business is uncertain. However, the UK Government is eager to see SMEs benefit from e-business adoption, which means that there is hope that SMEs will not miss out on this opportunity.

#### *Further research and development of CATE-b prototype*

From the literature reviewed and the limited case study analysis it was identified that SMEs need a sound and well-resourced integration plan in the form of a new e-business model if they are to create competitive advantage and win e-customers. Our proposed CATE-b prototype model was created with the intention that it allows SMEs to make the transition from an old system to a new, e-business organisation. Further development of the prototype will include a large national survey and in-depth case studies of fully integrated SMEs with the purpose to test the validity of current findings and to address the various research gaps identified in this study. This will achieve a better understanding of SMEs, their heterogeneous nature and complexity including owners/managers and their employees' attitudes towards e-business. Without the plan, it would be difficult for SMEs to succeed and create a competitive advantage in this new virtual environment in which businesses operate today.

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