



# Small firm e-business adoption: a critical analysis of theory

E-business  
adoption

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## Abstract

**Purpose** – The paper critiques a range of theories and evaluates their ability to provide a lens for explaining the idiosyncratic nature of small firms and their e-business adoption decisions.

**Design/methodology/approach** – This literature review firstly summarises the existing research evidence that shows that small firms are idiosyncratic when it comes to e-business adoption. It then critiques theories commonly used in the literature in this field to examine the extent to which they take this small firm idiosyncrasy into account when explaining e-business adoption decisions.

**Findings** – The critical analysis shows that no commonly-used theory adequately explains small firm adoption of e-business because each omits important aspects of small firm idiosyncrasy. The analysis suggests that an integrated theoretical framework is needed. Preliminary ideas on this framework are provided.

**Originality/value** – Existing research generally applies a small number of selected theories and formulates research models of adoption factors. However, there is no systematic analysis of theories in this field and no consensus about theoretical frameworks. This paper addresses this limitation of the literature by critically evaluating the commonly used theories in terms of their individual suitability as lenses for explaining small firm e-business adoption.

**Keywords** Small to medium-sized enterprises, Electronic commerce, Business planning, Business development, Decision making

**Paper type** Literature review

## 1. Introduction

There is extensive research on small and medium enterprise (SME) adoption of electronic business (e-business): at least 120 journal articles from 2003-2006 (Parker and Castleman, 2007) and at least 28 so far in 2007-2008. Many of these studies explore the factors (barriers and drivers) that influence SME owner-manager adoption decisions (e.g. Gibbs *et al.*, 2007; Gilmore *et al.*, 2007; Quaddus and Hofmeyer, 2007; Roberts and Toleman, 2007; Simmons *et al.*, 2008; Tan and Macaulay, 2007; Xu *et al.*, 2007). This plethora of studies suggests that it is an opportune time to explore the state of theory relating to SME e-business adoption.

Our analysis of this literature revealed that each article typically uses one to three theories (or subset of theories) to explain the influences on adoption decisions by SME owner-managers. The most commonly-used theories are:

- the resource-based view of the firm;
- Porter's models (generic strategies, industry forces and/or value chain analysis);
- theory of planned behaviour;



- technology acceptance model; and
- Rogers' diffusion of innovations theory.

However, there is no apparent agreement in the literature on or critical analysis of which theories (independently or in combination) best explain SME owner-manager e-business adoption decisions. Instead, the articles we analysed generally use only one or two of these theories to formulate their research models of adoption factors.

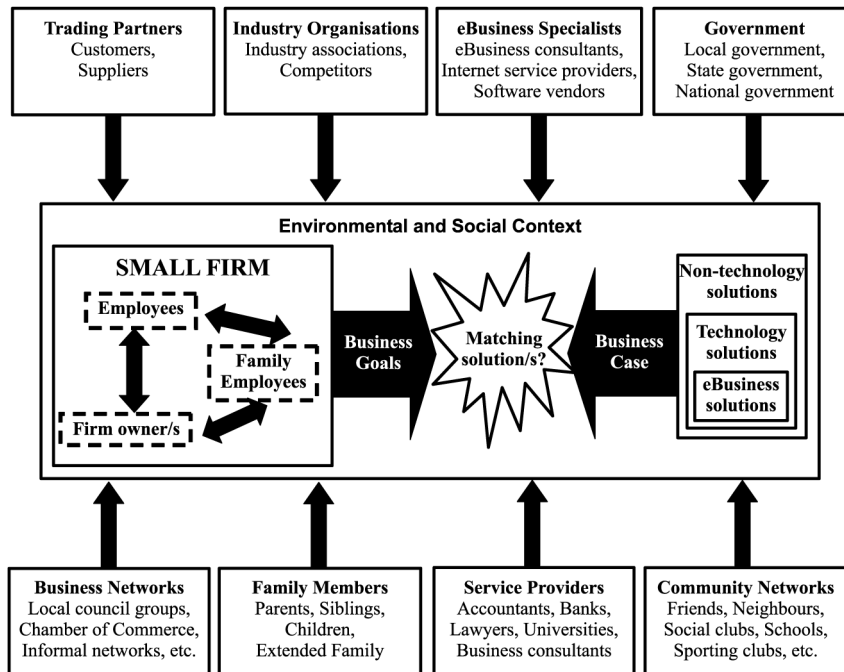
The major contribution of this paper is to address this limitation of the current literature by critically evaluating the commonly used theories in terms of their suitability as frameworks for explaining SME e-business adoption. It is also anticipated that this paper will provide the impetus for much needed theoretical debate and development in this field and help build a strong theoretical basis for future research. We focus on small firms (rather than SMEs more broadly) in this paper because they are highly idiosyncratic (Beckinsale *et al.*, 2006; Castleman, 2004; Parker and Castleman, 2007; Ramsey *et al.*, 2003) and can be characterised as social formations in which interpersonal relationships with family, friends and other businesses often influence their e-business adoption decisions (Castleman, 2004; Simpson and Docherty, 2004; Zheng *et al.*, 2004). In this context, it is therefore essential that theory for explaining small firm e-business adoption takes into account the idiosyncratic nature and social contexts of these firms. Our main conclusion in this paper is that because each theory has limited explanatory power, an integrated theoretical framework is likely to be needed. It is beyond the scope of the paper to develop this framework but we provide preliminary insights into its potential elements.

The paper begins by examining the influences on e-business adoption that illustrate the highly idiosyncratic and social nature of small firms, and considers the kinds of theory needed to take this context into account. We then evaluate the commonly used theories to show that, individually, none provides an adequate foundation for research on small firms' adoption of e-business. Finally, we provide some preliminary insights into the elements of a possible integrated theoretical framework that draws upon complementary theory that is used less commonly in the literature.

## 2. Influences on small firm e-business adoption decisions

In order to assess the suitability of theory we first need to understand the internal and external influences on small firm decision-makers as they consider e-business. We have illustrated these influences in a descriptive model (Figure 1) arising from our previous work (Parker and Castleman, 2007).

It has been well-documented that small firm owner-managers have disparate business goals. Some have economically rational goals such as competitive advantage and growth (Al-Qirim, 2005; Chong, 2006; MacGregor and Vrazalic, 2007). Others, by contrast, chose to keep their firm small to focus on family or their preference for lifestyle, enjoyment, socialising, autonomy, survival and stability (Castleman, 2004; Galloway and Mochrie, 2005). Family members can influence these business goals and e-business adoption decisions if they hold managerial positions (Butler *et al.*, 2007; McAdam *et al.*, 2004) or are trusted sources of advice (Butler *et al.*, 2007; Gibbs *et al.*, 2007; Shaw, 2006). E-business knowledge and home use of the internet by family has been found to provide the impetus for adoption in some small firms (Galloway and Mochrie, 2005; Martin and Matlay, 2003; Simpson and Docherty, 2004; Zheng *et al.*,



**Figure 1.**  
Influences on small firm  
e-business adoption  
decisions

2004). Similarly, employees can influence adoption decisions depending on their e-business knowledge (Al-Qirim, 2005; Beck *et al.*, 2005; Wymer and Regan, 2005), their perceived value as contributors to decision-making by senior managers (McAdam *et al.*, 2004), and their power and trust relationship with senior managers (Martin, 2005). Some small firm decision-makers prefer to get their e-business adoption and general business advice via informal, often highly social, business networks (Beckinsale *et al.*, 2006; Brown and Lockett, 2004; Gibbs *et al.*, 2007; MacGregor and Vrazalic, 2007; Simmons *et al.*, 2008).

E-business specialists and advisory services can have a positive or negative influence on adoption depending on their e-business capability and knowledge (Martin and Matlay, 2003) and their understanding of the small firm's business goals and needs (Brown and Lockett, 2004; Lawson *et al.*, 2003; Martin and Matlay, 2003; Simpson and Docherty, 2004). These external parties' influence also depends on whether they are prepared to help small firms learn about e-business (Kelliher and Henderson, 2006) and to develop their e-business capabilities (Xu *et al.*, 2007; Zhu *et al.*, 2003). Failure by external parties to fulfil these roles often results in frustration and dissatisfaction with specialists and with e-business itself (Al-Qirim, 2005; Kyobe, 2004).

E-business adoption can also be influenced by trading partners depending on the small firm's reliance on specific partners, the number of partners and transaction volumes (Zheng *et al.*, 2004). Some owner-managers value their personal relationships with trading partners and will not adopt e-business so they can maintain these relations (Beck *et al.*, 2005; Castleman, 2004; Zheng *et al.*, 2004). In addition, the influence of competitors depends on the intensity of e-business use within the industry,

whether e-business is the norm (Kaynak *et al.*, 2005; Khazanchi, 2005; McAdam *et al.*, 2004; Simmons *et al.*, 2008; Xu *et al.*, 2007), and the extent of globalisation in the industry (Fillis *et al.*, 2003).

In summary, the literature shows that small firms are idiosyncratic and often highly social formations with varying orientations (e.g. entrepreneurial firms, those with modest business goals, life-stylers). There are many permutations of array of influences on each small firm (each varying on a continuum from no effect to considerable impact), and small firm decision-making is highly contextualised. The literature therefore indicates that theory which aims to explain the e-business adoption decisions of small firms needs to:

- account for the complex network and interplay of the varying interpersonal relationships which can influence the decisions of small firm owner-managers;
- recognise the characteristics of the relationships among owner-managers, employees, family and various external parties (such as trust and the level of dependency);
- treat small firm decision-makers as heterogeneous individuals, rather than assuming there are a set of adoption factors which apply to every small firm; and
- assist researchers in identifying potential patterns of idiosyncrasy among small firms in terms of their social context and their business and interpersonal goals, so that various (predictive) research models can be formulated with each corresponding to a particular group of small firms exhibiting the same or similar adoption patterns, contexts and goals.

In the next section we outline the theories most commonly used by SME-e-business researchers and evaluate their suitability as lenses through which to explain small firm e-business adoption and the degree to which they take into account for the idiosyncratic nature of small firms.

### 3. Commonly used small firm e-business adoption theories

We have identified the most commonly used theories applied in small firm e-business adoption research as: resource-based theory; Porter's generic strategies, industry forces and/or value chain analysis; theory of planned behaviour; technology acceptance model; and Rogers' diffusion of innovation theory. We now examine their ability to explain small firm e-business adoption and their idiosyncratic nature.

#### 3.1 Resource-based theory

Resource-based theory (RBT) explains how firms can gain a sustainable competitive advantage by exploiting and developing resources (such as competencies, assets, know-how and capabilities) that are unique and therefore not imitable by competitors (Caldeira and Ward, 2003; Rivard *et al.*, 2006). The resources can be internal to the firm, or firms can access and exploit external resources (Ray and Ray, 2006) from the environment such as trading partners and customers. A number of the small firm adoption factors identified in the literature can be conceptualised as firm resources (see Caldeira and Ward, 2003) including owner-manager and employee characteristics. E-business technologies are also resources and e-business adoption is therefore seen to result when firms acquire and use e-business-related resources effectively (Caldeira and Ward, 2003; Rivard *et al.*, 2006).

The strength of RBT is that it highlights the capabilities that any firm, including small ones, must have or acquire to adopt e-business, and it recognises intangible as well as tangible resources. However, RBT assumes the resources are typically used to their fullest potential, which is often not the case with small firms (Caldeira and Ward, 2003; Rivard *et al.*, 2006). For example, studies applying RBT found that it was proactive firms who performed better with e-business because they used it to support their strategies and leverage competencies, and because they developed internal e-business capabilities (Caldeira and Ward, 2003; Rivard *et al.*, 2006). These studies also found that RBT did not explain adoption decisions of non-entrepreneurial firms, because external factors sometimes resulted in adoption even though these firms did not develop internal e-business capabilities or leverage their competencies (Ray and Ray, 2006; Rivard *et al.*, 2006). For this reason RBT (at least on its own) does not sufficiently explain the e-business adoption processes of non-entrepreneurial small firms.

### 3.2 Porter's industry forces, value chain and generic strategies

Porter (2001) has argued that his originally proposed generic strategies (niche marketing, cost leadership, product/service differentiation), industry forces and value chain analysis models are applicable in the internet era. Many e-business researchers appear to agree and have applied these principles in small firm studies. For example, the value chain has been used as a model for studying small firm enterprise resource planning (ERP) adoption (e.g. Schubert, 2007). Porter's generic strategies have also been used to examine the potential of small firms to gain a (sustainable) competitive advantage from e-business (e.g. Olsen and Sætre, 2007; Pavic *et al.*, 2007; Ray and Ray, 2006; Rivard *et al.*, 2006). The strengths of Porter's models are that they have been applied widely over decades and provide insight into the ways in which organisations of any size can proactively improve their strategic positioning.

The main difficulty with Porter's models, however, is that they explain only some of the considerations used by entrepreneurial small firms who proactively seek to achieve, enhance or maintain their strategic positioning. The research evidence informing Figure 1 suggests, however, that not all small firms have such a single-minded dedication to economic goals because some instead focus on family, lifestyle, enjoyment, socialising or survival. Many small firms are also characterised as having poor managerial skills (MacGregor and Vrazalic, 2007) and are less likely to recognise new business opportunities or improve their strategic positioning.

For this reason, Porter's models on their own do not sufficiently explain e-business adoption by all small firms. Rivard *et al.* (2006) and Ray and Ray (2006) came to the same conclusion and complemented Porter's externally focused industry forces and/or generic strategies with the internally focused RBT. These theories are useful for explaining how proactive, market-oriented small firms can gain competitive advantage (using e-business), but the literature shows that this is not characteristic of all small firms. So even when these theories are combined they still do not explain the e-business adoption decisions of all small firms.

### 3.3 Technology acceptance model and theory of planned behaviour

The technology acceptance model (TAM) and theory of planned behaviour (TPB), in contrast to RBT and Porter's models, are individualist theories aiming to predict

behaviour intentions. They have been applied in small firm e-business adoption research because the owner-managers are assumed to be the primary decision makers (de Guinea *et al.*, 2005; Premkumar, 2003) and, consequently, the person whose perception is the most significant determinant of adoption. TAM posits that perceived ease of use plus perceived usefulness are predictors of an individual's attitude towards use and intentions to use a technology (Grandon and Pearson, 2004). TPB, in contrast, hypothesises that three external variables (attitude, subjective norms and perceived control) collectively determine a decision-maker's intention (or conscious plans) to adopt. Their intention to adopt can then lead to actual adoption if the individual has control over the decision and no other environmental event occurs to change these plans (Harrison *et al.*, 1997). In the context of TPB, the attitude towards adoption is related to the strength of belief that mostly positive outcomes (such as short-term benefits) will occur from adoption. Subjective norms relate to whether decision makers believe that important individuals or groups (such as employees or customers) think adoption is appropriate and whether the decision-makers are motivated to follow these norms. Perceived control refers to whether the decision maker believes adoption is feasible given their resources, including time, personnel and access to consultants.

The strength of both TAM and TPB are that they are designed to measure and predict action in the immediate future. However they do not capture the complexity in which the actors' perspectives are forged and they take no account of the idiosyncrasies of individual small firms. This is apparent with TAM because it largely ignores the complex relationships between small firm decision-makers and employees, family and external parties. For example, Grandon and Pearson (2004), who used TAM, condensed these issues into just a few Likert statements such as "social factors are important in our decision to adopt electronic commerce", "our industry is pressuring us to adopt electronic commerce" and "our organisation is pressured by the government to adopt electronic commerce", without acknowledging the complex interplay of these and other issues.

TPB takes into account relationship issues to a greater extent as part of the social norms construct. For example, Harrison *et al.* (1997) included some external parties in their survey instrument (employees, customers, suppliers and vendors), and asked questions relating to whether these parties would expect adoption. However, the authors ignored the role of other parties influencing some small firms such as family, business and community networks, and industry associations as did Grandon and Mykytyn's (2004) TPB-based survey instrument. While these factors could be addressed by including these parties, TPB and TAM both assume that the influences of these parties on adoption intentions are discrete. These theories do not support the implication of our discussion of Figure 1 that the various influences are likely to be interrelated. They are not necessarily discrete or easily separated. For this reason, we therefore believe that exploring small firm e-business adoption will require explanatory theory rather than individualist predictive theories such as TAM and TPB.

#### *3.4 Diffusion of innovation theory*

DOI theory is an overarching framework that aims to explain the social and relational aspects of innovation diffusion and how this occurs over time in a social system. Rogers (2003) is the most commonly cited author on diffusion theory in the



SME-e-business literature, although he did not address e-business directly. Rogers outlines four key elements governing the rate of adoption of an innovation: the innovation; social system; communication channels and time.

In the context of DOI, e-business would be more accurately described by Rogers' notion of a technology cluster rather than an innovation, because it can be used for different business applications such as for sales, payments, procurement, employee recruitment, online banking and online service delivery (Parker and Castleman, 2007). One interesting point to note about the e-business literature is that it primarily applies the DOI innovation characteristics: relative advantage, compatibility, complexity, trialability and observability (e.g. Al-Qirim, 2005; Ching and Ellis, 2004; Chong, 2006). Few studies apply or consider explicitly the other elements of DOI. We argue that the real potential of DOI is its explanatory power when all four elements are considered together.

For example, only a few studies have applied Rogers' adopter categories (innovators, early adopters, early majority, late majority and laggards) to small firm e-business adoption (Lee *et al.*, 2007; Pavic *et al.*, 2007; Woerndl *et al.*, 2005), which profile adopters over time until complete diffusion has occurred in a social system. Other studies have identified subsets of Rogers' adopter categories (e.g. Ramdani and Kawalek, 2007; Roffe, 2004) or differentiated only between adopters and non-adopters (e.g. Ramsey and McCole, 2005). While it is unclear from this limited research whether Rogers' adopter categories are applicable to small firm e-business adoption, this perspective is at least consistent with our view that the idiosyncratic nature of small firms might potentially give rise to categories of adopters which have similar social contexts and business goals.

Rogers (2003) explains that innovations typically diffuse via interpersonal communication channels through a social system. This system can comprise individuals, informal groups and organisations, which appear at different levels including national and community. Every social system has its norms of expected behaviour that influence diffusion. For instance, highly innovative members are often seen as deviants by other system members who, by contrast, want to follow the norms (or at least be seen to do so). Opinion leaders, rather than innovators, are more likely to effect adoption or rejection by informally influencing others' attitudes, because they have earned respect based on competence, social accessibility and norm conformity. Rogers argues that interpersonal communication about new innovations is more effective among individuals who are homophilous or similar to each other because of their similar perspectives, views and experiences. Innovators, by contrast, are heterophilous because they are different to others in the system.

Rogers' DOI theory also includes individual or organisational innovation-decision processes. e-business adoption research suggests individual decision processes are more relevant to small firms because owners are often the primary decision-makers (de Guinea *et al.*, 2005; Premkumar, 2003). This process involves gaining knowledge of an innovation and basic information about it; forming an (un)favourable attitude (perhaps influenced by opinion leaders); making a decision about using it on a partial or trial basis; implementing the innovation fully; and then confirming if the decision was appropriate. The organisational decision processes (involving agenda-setting, matching, re-inventing, clarifying and routinising) is less appropriate because it implies a formal structure that is less common in small firms (Burke, 2005; Levenburg,

2005). However, the line between small firm adoption being the result of individual versus organisational processes is blurred because our earlier discussion about the influence of family and employees suggests owner-managers may not always be the only decision makers.

The main limitation of Rogers' focus on the individual decision process in the e-business context is that the technology systems are quite complex and knowing about e-business does not necessarily result in adoption (Simmons *et al.*, 2008). Rogers acknowledges that complex innovations require how-to knowledge to support the innovation-decision process. However, he does not consider how this knowledge is acquired. Attewell (1992) provides insight by arguing that know-how about complex innovations is gained via "learning by using" when firms adapt the innovation to their specific circumstances, and modify their processes to accommodate the innovation. Attewell points out, however, that many firms do not have the time or resources to do this, a situation that is especially true of small firms (MacGregor and Vrazalic, 2007). This presents a paradox because small firms are unlikely to develop e-business know-how until they (partially) adopt, yet they are less likely to adopt without e-business know-how.

Change agents within Rogers' DOI theory have a major role in overcoming this paradox. Attewell (1992) proposes that, in the context of complex innovations, third-parties termed "mediating institutions" might be a better conceptualisation of change agents. Mediating institutions create and build know-how (based on previous client implementations) and operate between innovation originators and potential adopters. Mediators therefore can initially reduce the knowledge barriers of potential adopters because they provide services which facilitate adoption and require little how-to knowledge. This in turn helps increase the diffusion of complex innovations as more firms take up the services of mediating institutions. Attewell argues that adopters will gradually develop know-how from their use of simple solutions, and progressively adapt or extend the innovations as learning occurs. Attewell therefore sees the adoption of complex innovation as an organisational learning and skill development process facilitated by the mediating institutions. Examples of such mediators in the e-business context would include application service providers, internet service providers and website developers. DOI theory suggests that these mediators might have more success encouraging adoption via a small firm's homophilous social or personal networks, not purely by approaching the firms directly.

While it appears that DOI theory offers a useful framework for explaining small firm e-business adoption, it does not adequately:

- Explain the issues and dynamics involved whereby small firms are part of multiple social systems (e.g. a family, a business network, a local community, an industry) with possibly contradictory norms, behaviours and beliefs. The theory does not provide a lens through which to examine these complex social and relational dimensions.
- Account for the disparate change agents (which are not necessarily just mediating institutions as suggested by Attewell), how their roles differ, and the interrelationships between change agents as well as with small firms themselves. Indeed, our earlier discussion suggests that not all e-business specialists are effective at encouraging adoption and could lead small firms to develop negative attitudes towards e-business.



#### 4. Toward an integrated theoretical framework

Our analysis of the theories commonly used in the literature suggests that they are inadequate, independently at least, as lenses through which to explain small firm e-business adoption and the idiosyncratic and social nature of small firms. We have argued that RBT and Porter's models help describe the e-business adoption behaviours only of small firms which are entrepreneurial, and that TAM and TPB largely ignore the social and interpersonal influences that shape their e-business adoption.

We have shown that DOI theory, by contrast, has the potential to provide an overarching framework for studying small firm e-business adoption because it encompasses innovations (in our case e-business applications), adopter categories (which acknowledges small firm heterogeneity), adoption decision-making processes and the interpersonal or social context in which adoption occurs. However, DOI has limitations because small firms blur the distinction DOI makes between organisational and individual decision-making, and because it does not provide a lens for examining the nature of relationships and the complex social contexts (including change agents) in which small firms make decisions. For this reason, we believe that additional theory must be combined with DOI to form an integrated theoretical framework for future research on small firm e-business adoption.

One such theory is social network theory (SNT) which posits that social context can influence the motives and behaviours of individuals (known as actors) and that organisations (including small firms) are socially constructed and are influenced by the characteristics and motives of all actors (BarNir and Smith, 2002; Pitt *et al.*, 2006; Shaw, 2006). In SNT individuals are embedded in a social context and considers social structure, the existence and type of relations, and the strength of relations known as social ties (BarNir and Smith, 2002). An actor's ties with another actor can vary on a continuum from strong (e.g. friends and/or those with frequent interactions) to weak (e.g. acquaintances). The tendency of actors to form groups (known as cohesive groups or cliques which are subsets of actors in a network with strong, frequent ties) can result in structural holes between groups in which little or no information might flow (Pitt *et al.*, 2006). Actors can also be categorised in SNT terms based on characteristics such as their centrality in a social network, such as the extent and number of ties they have to all other actors in the network (Pitt *et al.*, 2006). For this reason, in SNT relationships among actors are more important than the characteristics of individual actors.

SNT therefore complements DOI by providing a lens for examining the nature of relationships and the complex social structures associated with small firm e-business adoption, although only a few studies have applied SNT to small firm e-business adoption (e.g. Beckinsale *et al.*, 2006; Gibbs *et al.*, 2007; Pitt *et al.*, 2006). Another network theory which has been applied even less than SNT to this field is actor-network theory (ANT), except ANT (unlike SNT) includes objects which are also considered actors in a network, such as computer software, standards and hardware (see Tatnall and Burgess, 2002). In ANT, no distinction is made between human and non-human actors in a network. While ANT might also have potential as a complementary theory, we do not explore ANT in this paper because our focus is on the social human elements of small firm e-business adoption.

Rogers (2003) links the notion of weak ties from SNT with his argument that some degree of heterophily must exist within social systems for innovation diffusion to occur. This is because he sees strong ties as largely synonymous with homophilous

individuals who are close-knit cliques largely communicating only with one another. New ideas and innovations are therefore more likely to be discovered when individuals in the social system are exposed to more distant individuals outside their clique – this is the strength of weak ties. For this reason, it appears that there are synergies between SNT and DOI theory, because SNT provides a lens through which to examine the structures and processes of social systems that we have identified earlier as a major limitation of DOI theory. Unlike DOI theory, SNT does not assume there are discrete social systems, but rather considers all the social systems that an actor might participate in as part of their social network.

SNT advocates looking at three aspects of relationships between actors in a network (Hoang and Antoncic, 2003):

- (1) The content of the relationship, which can take such forms as information and advice, emotional support, know-how and business exchanges, as well as involve reputation elements whereby one actor will gauge the reputation of the other (and hence the value of the content) based on the other actor's prominence within the network.
- (2) The governance of the network, which includes trust between actors, power and influence, and threats of exclusion or loss of reputation, which in turn influence the richness and depth of the exchange between actors.
- (3) The structure of the network, or the patterns of relationships between actors, which can include the size of the network (or the number of links between one actor and others in the network), the extent to which actors can access links beyond their immediate contacts via the network, the type of relationship (e.g. friend, family, business, social versus economic, close versus distant), the frequency of interaction, and the duration of the relationship. Actors can also gain power or influence in a network by establishing links between actors (or between cliques) that do not already exist (known as bridging structural holes).

SNT therefore provides a useful contribution to understanding small firm adoption of e-business because it takes into account the structural, interaction and interpersonal aspects of a small firm owner-manager's social network which influences their decision-making:

- (1) Firstly, it encapsulates the e-business knowledge exchange networks among small firm owner-managers, employees, family, friends and external parties. This could include Attewell's (1992) notion of mediating institutions, Rogers' change agents and also the role of personal and business networks. SNT also takes into account that small firm decision makers might value knowledge sources from various actors quite differently.
- (2) Secondly, it describes the nature of the relationships that exist and the dimensions on which these relationships might influence the decision-making by small firm senior managers. Relationships between actors in a small firm network might vary, for instance, on such dimensions as the credibility and trust between small firm actors and their social and organisational contexts, and the ability of actors (e.g. e-business specialists) to fulfil expected roles in e-business adoption. In this context, SNT supports both an innovation supply as well as customer demand view of e-business adoption. For example, SNT can

be used to explain the aspects of the relationship between a small firm and an e-business solution provider that can influence adoption, such as the possible expectation gaps that the existing literature suggests can exist between them.

- (3) Thirdly, SNT supports the analysis of networks at different levels of granularity (Pitt *et al.*, 2006), such as networks within teams, business units, entire organisations and also inter-organisational networks. In this way, researchers can apply SNT to look at internal processes, culture and roles among small firm employees which influence e-business adoption (e.g. see Martin, 2005), the role and influence of e-business specialists and key small firm staff (e.g. Beckinsale *et al.*, 2006), as well as adoption at inter-organisational and industry levels of granularity.
- (4) Fourthly, the few researchers applying SNT have used it to study a small firm's social networks, and to map strong ties between various actors (e.g. Beckinsale *et al.*, 2006; Pitt *et al.*, 2006). These researchers then identified patterns of processes and relationships which emerged when comparing the maps from one firm's network to those networks of other firms being studied (e.g. Beckinsale *et al.*, 2006). For this reason, SNT can help researchers to identify patterns of small firm idiosyncrasy that we explained and recommended earlier as a potential way in which to formulate more successful predictive research models.

A major benefit that small firms can gain from their social networks is the ability to share and gain knowledge (Chaston and Mangles, 2000; Shaw, 2006). This knowledge exchange provides access to resources that small firms do not possess internally (Butler *et al.*, 2007; Gibbs *et al.*, 2007) and therefore helps them develop competencies (BarNir and Smith, 2002). This value that can be gained from a social network is called social capital (Balkundi and Kilduff, 2006), and can take the form of economic value (such as competitive advantage, reduced marketing costs) and emotional support (BarNir and Smith, 2002; Butler *et al.*, 2007). For this reason, there are apparent synergies between RBT and SNT. However unlike RBT, SNT does not assume that actors should always have economic goals, and instead acknowledges that small firm actors may well have non-economic goals (such as lifestyle, enjoyment) for which social network resources might be used (BarNir and Smith, 2002), and that they may not necessarily exploit the available resources to the fullest potential.

It therefore appears that an integrated theoretical framework for explaining small firm e-business adoption might include DOI as the overarching theory and SNT as a lens for contextualising the relational aspects that underpin small firm adoption decisions. It also appears that RBT might help explain the motivation of some small firms to use their social networks as a resource. Further research is needed, however, to develop these preliminary ideas into a more sophisticated proposal for an integrated theoretical framework to underpin future research into small firm e-business adoption.

## 5. Conclusion

This paper has argued that small firms are highly social, idiosyncratic formations and that we need theory that explains their e-business adoption by taking into account their unique relational nature relative to medium and large firms. We have shown that RBT and Porter's competitive advantage models are insufficient on their own for this purpose because they assume all small firms exclusively pursue economic goals

although this is not always the case. The paper has also highlighted that TAM and TPB are inadequate on their own because they oversimplify complex social processes into discrete constructs. We argued that DOI theory, when used in its entirety, has better explanatory power because it encapsulates the social dimension of small firm e-business adoption and because it treats adoption as a process rather than a collection of mitigating barriers and drivers. Social network theory offers a useful addition to our conceptual armoury because it explicitly acknowledges the relational aspects of small firm e-business adoption (which DOI theory lacks). It can help to categorise small firms based on patterns discovered within the idiosyncrasies of their e-business approaches. Attewell's notion of mediating institutions also complements DOI theory because it is these change agents who can facilitate the e-business learning process for small firms by offering e-business solutions which require minimal how-to knowledge. However, such change agents will be effective only if they tap into the social networks in which small firms participate and if they identify/target opinion leaders within these social networks.

This paper has provided some initial insights into the complementary nature of a range of theories that need to be integrated to provide a holistic explanation of small firm adoption of e-business. We anticipate that this work, and our future development of small firm adoption theory will provide the basis for research that identifies categories of small firms encapsulating patterns of idiosyncrasy by focusing on the relational aspects of their e-business adoption. The research models developed from this endeavour should more accurately predict the e-business adoption intentions of small firms with similar profiles. More importantly, we believe that intervention strategies of e-business specialists and policies of government will be better formed when they are based on more holistic explanations of small firm adoption processes and considerations.

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