



Reconceptualising e-business performance measurement using an innovation adoption framework

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Abstract

Purpose – Previous empirical research into the performance measurement of exemplary e-businesses has pointed to a lack of progress in developing distinctive performance metrics for e-business and a failure to adopt best practice in performance management. The objective of this paper is to reconsider the evidence from that study by drawing on innovation adoption theories.

Design/methodology/approach – The paper re-examines the findings from case study-based research that investigated leading e-business performance measurement practices. The study suggests that there are limitations in analysing the findings using normative best practice, the dominant paradigm within performance management. Given that e-business innovation relies on the adoption of multiple technologies this paper reconsiders the findings using the conceptual perspective of the innovation adoption literature.

Findings – The study highlights the importance of individual, cognitive, social and cultural influences in an organisation's operating environment on its willingness to adapt performance measurement metrics for online business activities. The findings point to the benefits available from incorporating new theoretic perspectives in performance measurement research.

Research limitations/implications – The work points to a need to adopt a more context-specific approach to the development of e-business performance measurement. Furthermore, it indicates ways in which both the understanding and practice of performance measurement in e-business can be advanced.

Originality/value – This paper highlights the limitations of current performance management literature as monopolised by normative best practice thinking, and argues for the need to incorporate other theoretical perspectives into performance management research.

Keywords Performance measurement, Electronic commerce, Performance metrics, Technological change, Innovation in ICT, Innovation

Paper type Research paper



Introduction

The use of internet information and communication technologies (ICTs) to support business activities, commonly referred to as “e-business” is now so widespread as to be all but ubiquitous in the vast majority of organisations of all kinds. According to the Office of National Statistics (2010) internet sales represented 16.7 per cent of the value of all sales of UK non-financial sector businesses. The most recent data show that the value of e-business sales rose to £408bn in 2009, an increase of 24.9 per cent from the

2008 figure (Office of National Statistics, 2010). In addition, internet usage amongst the general population is amongst the highest in the world, most recently measured at 76.4 per cent of the UK population (Internet World Stats, 2009) underpinning record online retail sales growth of 17 per cent (*Financial Times*, 2010). Participation in the world of on-line business typically requires significant financial investments, not only in technological infrastructure but also in the processes and people necessary to operate them successfully (E-business Watch, 2008). In most organisations, investment proposals for the adoption or increased use of e-business are likely to have to compete for funding and resources with many other potential projects. As such, it might be expected that businesses would subject e-business investment proposal to the same degree of scrutiny as any other. It might also be expected that businesses would wish to monitor the performance of the resulting on-line business operations once implemented in order to ensure that anticipated results were being achieved. Undertaking such performance evaluation and monitoring requires that the organisation's performance measurement regime can provide the information that is both necessary and suitable for the on-line business environment. There is no shortage of advice for practitioners from both researchers and consultants about how to undertake effective performance measurement. In particular, the performance measurement literature is dominated by "best practice" prescriptions and models such as the balanced scorecard (Huang *et al.*, 2009). Most of these models emphasise the need to align performance measurement processes with the organisation's business strategy. However, as yet, little attention has been given to how performance measurement programmes might need to be adapted to meet the requirements of e-business or inform e-strategy as companies look to revise their business models and integrate their value networks (E-business Watch, 2008).

In recent empirical research, Barnes and Hinton (2008, 2009) investigated e-business performance measurement in successful e-business adopters. However, they found that even organisations that might be seen as exemplary in their use of e-business had made little progress in developing distinctive performance metrics for e-business. The organisations that they examined displayed little interest or willingness to undertake major overhauls of their existing approaches to performance measurement. Rather, they preferred to make incremental rather than radical changes when addressing their need for e-business performance metrics. Given the strategic significance attributed to the adoption of e-business innovations by many researchers and commentators (e.g. Porter, 2001; Hamilton, 2007), it is perhaps surprising that these organisations had made little or no change to their existing performance measurement systems. Contrary to the practices advocated in the performance measurement literature, these organisations tended to take an *ad hoc* rather than a systematic approach and made little or no use of best practice models.

Whilst there were a number of limitations to Barnes and Hinton's research (including its use of a small convenience sample), it does point to several incongruities between real-world practice and the performance measurement literature. However, the gap that they identify between theory and practice is based solely on an analysis between their empirical findings and one theoretical perspective, namely that of normative best practice, which is the dominant paradigm of the current performance management literature. Nevertheless, there are other perspectives that might be usefully employed to examine their findings. In particular, the innovation adoption

literature offers a number of different perspectives on behaviours observed when new technology is introduced into an organisation with the intention of changing business processes and practices. The advent of e-business, relying as it does on the adoption of internet ICTs, is clearly an example of innovation adoption centred on technological change. Innovation adoption has its own specific literature that is distinct from that associated with business performance management. As such, it might be expected that this literature could provide additional insights into the way that organisations behave when adopting e-business practices.

The aim of this paper is to reconsider the findings from Barnes and Hinton's (2009) research through the lens of the innovation adoption literature. After this Introduction the paper is structured as follows. The Literature review, which follows, is in three parts. The first considers the dominance of normative prescriptive models in the performance measurement literature. The second part points to the relative dearth of literature that considers performance measurement issues in e-business. The third part provides an overview of those theories from the technology adoption literature that might provide an appropriate lens through which to view the adaption of approaches to performance measurement for a variety of e-business scenarios. The Empirical research section then provides an overview of the original research study, including its aims, methodology and findings. The Discussion section is also in parts. The first part considers Barnes and Hinton's findings in the light of the performance management literature. The second part re-considers the study's findings in the light of the various theories offered by the innovation adoption literature. The paper draws the various strands of its discussions together in the Conclusion section, which also suggests further research, which might usefully be carried out.

Literature review

Performance measurement literature

The notion of performance is extensively used in all areas of management. Despite this widespread use, its exact meaning is rarely defined. As Lebas and Euske (2002) observe "performance is one of those 'suitcase words' in which everyone places the concepts that suits them, letting the context take care of the definition". Neely *et al.* (2002) defined performance measurement as "the process of quantifying the efficiency and effectiveness of past action". This recognises performance measurement as a tool to support decision making but there is still debate about the degree to which performance measurement should or should not be considered as a performance evaluation process (Moullin, 2007).

Interest in performance measurement in organisations received a considerable fillip from the introduction of the Balanced Scorecard (BSC) by Kaplan and Norton (1992). This was prompted by a growing dissatisfaction with traditional financial performance measures, which were criticised for being backward-looking and internally focussed. The BSC aimed to achieve a more holistic approach to performance measurement by the addition of non-financial, external and forward-looking measures to form a multi-dimensional performance measurement framework based on four key perspectives (financial, customer, internal process and innovation) that encompass both operational and strategic measures. Whilst a number of other similar "balanced" or "multi-dimensional" performance measurement frameworks have been developed (Bourne *et al.*, 2000) including the performance measurement matrix (Keegan *et al.*,

1989), the performance prism (Neely *et al.*, 2002), and the Business Excellence model (EFQM, 2005), the BSC has become pre-eminent (Marr and Schumia, 2003). Neely (2005) claims that the BSC has come to dominate not only performance measurement research but also practice, where anything between 30 and 60 per cent of firms have adopted the BSC in some form. Kaplan and Norton have gone on to develop the BSC as a tool for planning, implementing and controlling strategy by linking its performance measures to organisational strategy and goals (Kaplan and Norton, 1996; 2000). This tool has become extremely popular in both the public and private sector (Radnor and Lovell, 2003).

However, some criticisms have been voiced about the increased attention given to performance measurement and the BSC specifically. Noting the costs associated with installing and operating increasingly comprehensive and complex performance measurement frameworks, Neely and Austin (2000) argue that for some, measurement has become something of an obsession. Franco and Bourne (2003) argue that there is not much evidence to support the assertion that the BSC or other performance measurement frameworks have much of an impact on organisational performance. Johnston *et al.* (2002) have questioned the extent to which the BSC and its counterparts have been embraced in practice. They found that successful large organisations tend to simplify their approach to performance measurement in order to concentrate on understanding the key drivers of business performance rather than worrying about the detailed application of performance measurement frameworks. Whilst, Garengo *et al.* (2005) note that resource constraints tend to mean that small businesses tend to implement performance measurement systems in a fairly *ad hoc* fashion, limiting the range of measures used and rarely taking a holistic approach.

More critically, however, are the observations made by Voelpel *et al.* (2006). They stress that all traditional business performance measurement suffers to a great extent because of the “underlying and increasingly invalid assumptions rooted in the industrial economy”. By contrast, the demands of the innovation economy are not sufficiently accounted for by these approaches and “in today’s dynamic networked world, it is increasingly being accepted that the whole is more than the sum of the parts, and holistic thinking and approaches should replace, or at least complement, analytical ones” (Voelpel *et al.*, 2006). Reconceptualising performance measurement as a management innovation offers the potential to incorporate new perspectives capable of adapting to the innovation economy.

E-business performance measurement literature

Given the scale of investment in e-business and the claims of its ability to radically transform business processes, it is surprising to discover that so little research seems to have been published on the topic of performance measurement in e-business. The need for such research has certainly been recognised. Tonchia (2002) is amongst those who have argued for new kinds of performance measurement for e-business. Straub *et al.* (2002, p. 117) claim that “the unique characteristics underlying the Web may in some cases require new metrics, or at least the careful evaluation of existing ones to facilitate the development of innovative solutions to emerging problems”. Likewise, Alfaro *et al.* (2002) state that companies that are trying to develop e-business capacities need to evaluate whether their current systems for managing enterprises are adequate when new business models appear. Marr and Neely (2001) report widespread

dissatisfaction with existing performance measurement practices in e-businesses, which leads them to question the appropriateness of existing performance measurement for e-business. Similarly, Hinton and Barnes (2005) point to the lack of any consensus amongst practitioners about the effectiveness of existing approaches for measuring e-business performance.

Some researchers have considered the challenges associated with developing e-business performance measurement. Epstein and Rejc (2005) point to the difficulties of disaggregating the contributions of existing and e-business processes. Whilst Jutla *et al.* (1999) argue that it is unlikely to be feasible to create a single set of all-encompassing performance measures.

As might be expected, there have been some attempts to adapt the BSC for e-business. Plant *et al.* (2003) incorporated four additional perspectives (brand, service, market and technology) to the traditional customer perspective of the BSC. Bremser and Chung (2005) combine the BSC methodology with existing taxonomies of e-business models to develop a framework for e-business performance measurement. Based on an analysis of the wider e-business literature, Barnes and Hinton (2008) argue that e-business metrics are needed for the performance of the website (Zeithaml *et al.*, 2000; Barnes and Vidgen, 2001), the performance of business processes (Siaz *et al.*, 2002; Hinton *et al.*, 2003; Wu *et al.* (2003), the performance of customers (Hinton *et al.*, 2003; Wu *et al.*, 2003; Reichheld and Scheffer, 2000; Minocha *et al.*, 2004; Voss, 2003) and the link between e-business and business strategy (Chang *et al.*, 2003; Rangone *et al.*, 2002).

These various adaptations to e-business performance measurement fail to adequately address the holistic nature of the change brought about by e-business applications. However, when e-business is framed in terms of broader concepts of innovation it becomes possible to distinguish between innovation in e-business models and innovation at the systems level. An emphasis on the business model level allows for a recognition of e-business as a dynamic bundle of multiple technologies in any given context. Tiwana and McLean (2001) contend that “irrespective of the innovation at the business-model level, systems-level innovation in e-business is largely architectural” relying on “systems that recombine existing technologies in novel ways”. Such a focus may permit performance measurement to adapt to the range of both incremental and disruptive changes brought about by e-business at a business model level.

The innovation adoption literature

The innovation adoption literature offers a number of different theories. These can be categorised into three different types, depending upon their focus, namely the collection of technologies being used that constitute an innovation, the organisation using it or the individual organisational employee using it. The importance of context to technology adoption has long been established (Linstone, 1981) where the interplay of the technological artefact with organisational and individual factors is seen as critical.

Technology-focussed theories. The best known technology-focussed theory is the diffusion of innovation theory (Rogers, 1962), which sees the adoption of a new technology as a social process within the affected community. As members of the community gain knowledge about the innovation they will demonstrate variable

degrees of willingness to adopt depending upon the characteristics that determine their individual propensity to do so. Rogers classifies technology adopters as innovators, early adopters, early majority, late majority or laggards. Applying the work of Rogers to ICT innovations, Moore and Benbasat (1991) argue that the rate of adoption depends on eight factors:

- (1) voluntariness;
- (2) perceived need;
- (3) compatibility;
- (4) image;
- (5) ease of use;
- (6) result demonstrability;
- (7) visibility; and
- (8) trialability.

Rogers further argues that an innovation will only become established and self-sustaining once there is a “critical mass” of adopters. Subsequent research on the diffusion of innovation theory (e.g. Bradford and Florin, 2003) has established that technical compatibility, ease of use, and perceived need are important antecedents to the adoption of innovations.

Organisation-focussed theories. We identify three relevant organisation-focussed theories:

- (1) institutional theory;
- (2) organisational learning theory; and
- (3) the Technology-Organization-Environment framework.

Based on the work of authors such as Selznick (1948), Powell and Dimaggio (1991) and Scott (1995), institutional theory focuses on the social processes that govern behaviour in organisations. These include the rules, norms, routines and rituals of organisational life. Institutional theory rejects the rational-actor model of classical economics. Instead it looks to cognitive and cultural explanations for behaviour in and around organisations, taking the organisation as its unit of analysis. Furthermore, it stresses the external pressures faced by organisations. It argues that, in order to survive, organisations need to conform to the rules and belief systems prevailing in their operating environment.

Organisational learning theory stresses the benefits of organisations adapting to environmental change via a collective learning process. Leading contributors include Argyris and Schon (1978), March and Olsen (1975), Nonaka and Takeuchi (1995), Senge (1990) and Daft and Weick (1984). For learning to occur in an organisation, the learning process needs to progress through the following stages. Firstly data must be acquired about performance. This data must then be interpreted. Actions can then be taken based on this interpretation. Finally, feedback must be sought about the actions taken. When continuously applied, this process can form a continuous cycle of learning and adaption, which may be salient to an emphasis on the business model level, as outlined above.

The Technology-Organization-Environment (TOE) framework brings together the technology and the organisation focus. It argues that technology adoption is influenced by three sets of factors: the technological context, the organizational context, and the environmental context (Tornatzky and Fleischer, 1990). The technological context includes the internal and external technologies that are relevant to the organisation. The organisational context encompasses organisational size, the degree of centralisation, the degree of formalisation, managerial structure, human resources, the amount of slack resources, and linkages among employees. The environmental context includes the size and structure of the organisation's industry, its competitors, and the macroeconomic and regulatory environment.

Individual-focussed theories. The most influential individual-focussed technology adoption theory in the field of information systems (IS) is the Technology Acceptance Model (TAM) proposed by Davis (Davis, 1989; Davis *et al.*, 1989). TAM argues that an individual's intention to use a system will be determined by their perception of both its usefulness and ease of use. An individual's actual use of the system is seen as being dependent on their intention to use it. (This assumes that if they have such an intention they are free and capable to do so.) Perceived ease of use is also seen as being dependent upon perceived usefulness. TAM is, in essence, an adaptation of Ajzen and Fishbein's (1973) Theory of Reasoned Action (TRA) for the IS environment. TRA argues that individual behaviour is driven by intention. Behavioural intention is seen as being dependent on individual attitude toward the behaviour and the subjective norms associated with the behaviour. Attitude is determined by individual belief about the outcomes of undertaking certain behaviour. Subjective norms arise from the influence of the people in an individual's social environment.

Empirical research

Barnes and Hinton (2008) investigated how organisations were adapting their performance measurement systems and practices in response to changes in their business operations as a result of the adoption of e-business. Its main aims were to identify the features and benefits of an effective e-business performance measurement system. Using a case methodology based on interviews with managers with responsibility for e-business operations, the research investigated twelve organisations including examples from the public and private sector, manufacturers and service providers, large multi-nationals and small owner-managed businesses. To be included as a case study, each organisation had to demonstrate some success in developing performance measurement systems for the online environment and be willing to participate in the research. A summary of the case organisations and their e-business applications can be seen in Table I. Pseudonyms have been used to protect confidentiality. More extensive case descriptions can be found in Barnes and Hinton (2008).

Given the kind of organisations that they were studying, Barnes and Hinton had expected to find that the adoption of e-business would have led to:

- a strategic review of existing performance measurement systems;
- the development of distinctive performance measurement systems for e-business;

Case organisation	E-business applications
<i>MNEs</i>	
Materialco	The company sells high specification materials to OEMs whose products operate in highly demanding environments. The industry in which Materialco operates is being driven to use e-business by the OEMs in three ways: electronic bidding for contracts, electronic exchange of documents and production scheduling. Materialco uses e-business to improve customer service and reduce staff costs
Telecom Services	Uses an online workflow management system to monitor progress on its various product development projects. The system provides a broad range of performance metrics for its staff who operate predominantly in a virtual environment
Legalco	Is a large corporate legal practice employing 3,000 lawyers in more than 20 countries. They operate a number of online services including some that support the work of its own staff, some that offer generic help in particular industries and some that facilitate transactions with individual clients
Private Banking Services (PBS)	Is the subsidiary of a global financial services group. It provides private banking services to wealthy customers through a network of several hundred client advisors. Its clients can view their accounts and portfolios online via the bank's website. In addition, it has established a PBS product platform that enables financial intermediaries to get access to the full range of PBS's products and services
<i>SMEs</i>	
Insureco	Has developed software that enables insurance business to be conducted online. The system is essentially an internet based tool that enables insurance businesses and their channel partners (insurer, broker, agent) to quote, bind and manage insurance products online in real time
Software Co	Is a provider of specialist customized software, principally to business clients. The company's main objectives in its use of e-business are to strengthen its relationships with its customers and brand building. Internally, it uses e-business technologies to support remote working and promote integration across its various sites. It makes extensive use of the internet for sales administration, human resource management and for joint working on documents by staff at different locations
Education Support Materials (ESM)	Is an online business selling learning support materials. Its products are bought by schools and parents and ESM's business model relies completely on its use of e-business. This also enables ESM to provide ongoing support for its three customer groups: teachers, parents, and children. The aim is to create supportive communities in each area
Trainingco	Is a small company that designs bespoke training solutions for corporate clients. They use an online project management system within their operations to manage their network of virtual teams. They also incorporate e-learning technologies into their training packages for their clients

(continued)

Table I.
Case organisations'
e-business applications

Case organisation	E-business applications
Public sector Intergov	Is a non-profit inter-governmental organisation funded by 30 countries. Its e-business activities are concerned with information sharing between its own staff and those of its member country governments. Use of the Intergov private internet network enables approved clients to securely access internal documentation, as well as its publications and statistical products
Port Authority	Is responsible for managing the navigable waters of one of the UK's largest ports. They use e-business for two main purposes; to manage shipping activity and cargo movements, and to manage the movement of pilots for ships entering or leaving the port. Additional online services support terminal operators, dredging companies, and other third party users of the port's facilities
Coastal Hospital	Is a large NHS general hospital serving a local population of around 300,000 in England. The hospital has recently introduced e-business technologies into its materials procurement and management systems. The objective is to improve both operating efficiency and service levels
Trade Union	Is one of the UK's largest unions with members employed mostly in local government. The union has a national website and a linked regional site. The latter operates autonomously, owned and run by the members. Both sites currently have only a low level of interactivity for open access, aimed principally at members. However, the union has implemented support systems for its own employees to facilitate remote working

Table I.

Source: Adapted from Barnes and Hinton (2009)

- modifications to capital investment appraisal methods for e-business investments; and
- the use of best practice models (e.g. BSC) to underpin the development of new e-business performance measurement systems (Barnes and Hinton, 2009, p. 340).

Instead the main findings of their study were that:

- Organisations tended to take an *ad hoc* incremental approach to adapting performance measurement systems for e-business.
- There was a marked reluctance to embark on major overhauls of existing performance measurement systems, with organisations apparently concerned about where the potential costs of so doing would outweigh the benefits.
- Organisations preferred to use or adapt existing measures to monitor e-business performance, or to add new metrics to those already in use.
- There were a variety of approaches to adapting performance measurement systems for the online environment, with no common framework apparent.

- Although most organisations were measuring more than one aspect of e-business performance, no organisation had a true portfolio of e-business performance metrics.
- There was no sense of balance between the measures used, with each organisation tending to adopt its own specific focus on e-business performance measurement. (The focus might, for example, be on finance, customers or processes.)
- Whilst there was a common concern to link e-business performance to organizational objectives, practice was similarly patchy in this regard and not all organisations had performance metrics appropriate to their e-business aims.
- Organisations tended to assess capital investment proposals for e-business in the same way as for other capital investment proposals.
- None of the case organisations used a best practice performance measurement framework, such as the Balanced Scorecard to underpin their e-business performance measurements.

Discussion

The study's findings and the performance measurement literature

The results of their research led Barnes and Hinton (2009) to muse about why the organisations they studied preferred incremental rather than radical changes to performance measurement as a result of the adoption of e-business. In particular, they wondered why apparently well managed and high performing organisations eschewed the best practice models advocated in the performance measurement literature (such as the BSC) with respect to their e-business developments.

They posited four possible explanations for this (Barnes and Hinton, 2009, pp. 340-341). First, that the organisations studied were unaware of best practice in performance measurement. Given, the nature of the organisations concerned, they considered this to be unlikely. Second, that the organisations did not consider e-business to be a sufficiently strategic issue to merit significant changes to their performance measurement systems. Again, they considered this to be unlikely. Third, that the organisations had avoided major changes due to considerations of cost and disruption. Whilst they conceded that this was possible, they argued that their research had found no evidence of this being an explicit concern for the organisations they studied. Finally, that, given the fast changing environment for e-business, organisations prefer an incremental and experimental approach to performance measurement adaptation. This, they thought, was the most likely explanation. Although the practices that they had observed were at odds with the mainstream performance measurement literature, they were arguably entirely appropriate given the context in which organisations were operating.

If these organisations were right in their approach to developing e-business performance measurement systems, it is then possible to question the inadequacy of the best practice performance measurement literature in the specific context of e-business. More generally, it raises the question of whether current best practice models equate to good practice in every context. In particular, it may be that an incremental experimental approach is good practice in dynamic and turbulent environments such as that currently being experienced in the field of e-business.

The study's findings and the innovation adoption literature

Innovation adoption theories seem to offer possible new insights into the findings from Barnes and Hinton's study.

The diffusion of innovation theory emphasises the fact that the adoption of innovations takes place within a social context. As all the organisations in Barnes and Hinton's study had embraced the new technologies of e-business, it seems likely that the individuals involved had the relatively high propensity for adoption associated with innovators or early adopters. However, it may be that the rate of adoption of the sorts of e-business practices (in this case associated with changes to performance measurement) that might have been expected is very slow because they did not perceive most of the factors identified by Moore and Benbasat (1991) as influencing adoption (namely: voluntariness, perceived need, compatibility, image, ease of use, result demonstrability, visibility, and trialability) as yet being sufficiently important. It certainly seems to be the case that there is as yet, no critical mass of adopters of new e-business performance measurement approaches in the business community. This may be because the antecedent conditions associated with technical compatibility, ease of use, and perceived need are not yet satisfied. Another possible explanation may be found within the technology transfer literature where the organisational receptivity to new technology is acknowledged (Jeffrey and Seaton, 2004; Trott *et al.*, 1995). Specifically, there may be a gap between the adoption of e-business and the assimilation of this technology into the case study organisations.

Institutional theory also stresses the role of social processes in organisations. However its stress on cognitive and cultural issues emphasises that neither individuals nor organisations operate in isolation. If, as seems to be the case, there is little interest in, or importance attached to the development of performance measurement within the e-business community in general, it is not surprising that any of the organisations studied by Barnes and Hinton have given the matter much attention. It seems likely that there is no conception of what constitutes best practice in e-business performance measurement in these organisations because it is not in the collective conscious. Put simply, no-one has thought much about it.

Organisational learning theory perhaps points to what organisations are missing out on by not placing greater emphasis on performance measures for their e-business operations. Organisational learning theory sees appropriate performance measurement as the start point for any collective learning to take place. The failure to collect and analyse data on e-business performance can only mean that organisations will be so much slower to learn from their initial forays into of e-business. Seen from this perspective, this failure is doubly disappointing. The *ad hoc* incremental approach towards performance measurement displayed in these organisations is in effect an experimental approach, which could offer them an excellent opportunity to learn. However, their failure to collect necessary data means that they are not in a position to capitalise on their experiences.

The TOE framework emphasises that technology adoption is influenced by many factors beyond the technology itself. Its emphasis on the impact of both organisational and environmental influences points to the need for researchers to collect data on these factors in a systematic fashion, in order that comparative analysis can be undertaken. It is evident that Barnes and Hinton did not do this in their research. Had they done so they might have been able to shed more light on the different approaches to e-business

performance measurement observed in the various organisations that they studied. It might, for example, have enabled them to understand why organisations tended to place different emphasis on different performance measures (finance, customers, or processes). The TOE framework may also point towards the need for a more contingent approach to e-business performance measurement than that suggested by the best practice literature. It may be that organisations need to tailor their e-business performance measures in the light of their particular operating contexts.

The TAM puts the focus on individual users of technology. It emphasises the need to develop positive attitudes towards the use of innovation by making the technology easy to use and stressing its importance. The TRA also emphasises the influence of peer group members on an individual's likely use of new technology. Unfortunately, Barnes and Hinton's analysis takes neither the attitudes of individual organisational members nor their interactions with others into account. Doing so seems likely to have provided additional insights into the practices observed, as they may well have had their origins in individual attitudes towards the use and usefulness of e-business technologies.

Conclusions

Attempting to *post hoc* rationalise empirical data collected without reference to the theories now being considered is bound to be problematic. However, we argue that this new analysis can point to possible new interpretations of the incongruities between real-world practice and the performance measurement literature identified in Barnes and Hinton's work.

The contribution of this paper is threefold. First, it has provided additional insights into existing research, namely that of Barnes and Hinton (2008, 2009), whose findings seem problematic when viewed through the lens of the existing performance measurement literature. However, when viewed through the lens of theories from the technology adoption literature, new understandings and new avenues for further investigation have been uncovered. In particular, the analysis highlights the importance of individual, cognitive, social and cultural influences in an organisation's operating environment on its willingness to adapt performance measurement systems for on-line business activities. This in turn, points to a need to adopt a more context specific approach to the development of e-business performance measurement systems. Second, it points to ways in which both the understanding and practice of performance management in e-business can be advanced. Incorporating a consideration of the various factors highlighted by the various technology adoption theories seems to offer a means of progressing beyond the narrow context-free prescriptions of the best practice literature. Third, it highlights the limitations of current performance management literature, dominated as it is by normative best practice thinking. Breaking free from this requires willingness to incorporate other theoretical perspectives into performance management research.

In closing, we would point to the need for further research to be conducted that views the development of performance measurement systems for e-business through lenses other than that of the best practice literature. It is unlikely that any single study could satisfactorily encompass all of the theories mentioned in this paper, let alone the many other theories that might also offer additional understandings. Consequently, we argue the need for a new direction in e-business performance management research

away from the narrow constraints of the application of normative models. These have proved unable to provide a full and sufficient understanding of observed practice such as that described in the empirical findings of Barnes and Hinton. The application of a wider range of theories seems more likely to offer a route to a richer and deeper understanding of the emerging practices of e-business performance measurement.

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