

A Resource-Based View of the Build/Buy Decision: Emergent and Rational Stepwise Models of Strategic Planning¹

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Two ideal models of strategy development are identified: one rational stepwise; the other emergent, ex-post, relying on experimentation, where strategy is used to legitimise what has already been accomplished.

Key points

Capabilities for both strategy development models may be acquired internally or externally, but with the emergent, ex-post model, core capabilities are acquired internally through experimentation. These outcomes lead to a richer resource-based view of emergent strategy, and suggest a diverse range of strategic options. The findings suggest that firms might deliberately take an ambidextrous approach and seek a balance of planning and emergence in their strategy process.

Introduction

The development of new products and entry to new markets is a strategic process (Ansoff, 1965) and is a function of strategic choices about organisational development. The choice of approaches for researching such strategic choices includes mainstream strategy research, organisational economics, and industrial organisational analysis. The resource-based view

(RBV) of the firm, an important approach to understanding strategy (Ambrosini, Bowman, & Collier, 2009; Easterby-Smith, Lyles, & Peteraf, 2009; Kyrgidou & Spyropoulou, 2012), fits well with all of these approaches and provides a deep understanding of how organisational resources are combined and deployed (Peteraf, 1993).

This research employs the resource-based view as a lens through which to investigate strategy development in the deployment of new technologies. The context for the research is information systems (IS) deployment in the public sector, specifically, the deployment of information systems in UK universities. It seeks to add to a long-standing debate about the role and nature of competencies and capabilities, their acquisition, and the process of strategy development (Ambrosini et al., 2009; Barney, 1991; Buckland, 2009; Duysters & Hagedoorn, 2000; Easterby-Smith et al., 2009; Eisenhardt & Martin, 2000; Grant, 1998; Hagedoorn & Duysters, 2002; Hamel & Heene, 1994; Kogut & Zander, 1992; Kyrgidou & Spyropoulou, 2012; Marino, 1996; Montealegre, 2002; Penrose, 1959; Peteraf, 1993; Prahalad & Hamel, 1990; Rouse & Daellenbach, 1999; Teece, Pisano, & Shuen, 1997). The RBV considers organisations as stocks of resources bundled into capabilities and competencies and proposes that organisations need to develop or acquire appropriate capabilities that can be leveraged to enter new products or markets (Duysters & Hagedoorn, 2000). Although emergent strategy is addressed to some extent (Wernerfelt, 1984), the dominant view of strategy formulation in RBV approaches is a rational, stepwise progression through a series of capability and competency acquisitions and deployments leading to their embedding in organisational routines (**Error! Reference source not found.**) (Grant, 1998; Kogut & Zander, 1992). There is an assumption that all organisations have strategies (Buckland, 2009) and that strategy is developed in response to managerial perceptions of the need to change (Ambrosini et al., 2009). However, this strategic process is not consistent with an emergent, bottom-up view of strategy (Buckland, 2009; Easterby-Smith et al., 2009). The aim of this research, therefore, is to provide a basis for understanding how a model of emergent strategies might be incorporated in the RBV.

Insert figure 1 here

This research considers how emergent strategies may form part of the RBV via

investigation of the process of strategic development for the exploitation of new technologies and considers when new capabilities are required and their sourcing is to be decided. It specifically asks:

1. RQ1: *What is the process of strategy development when exploiting new technology?*
2. RQ2: *At what stage are new capabilities and competencies acquired when exploiting new technologies?*
3. RQ3: *How are new capabilities and competencies acquired when exploiting new technologies?*

The required capabilities and competencies may vary at different times during the early stages of technology use (Montealegre, 2002). Some may exist within the organisation, either developed internally or bought in (Ambrosini et al., 2009), some may be shared, and some outsourced (Hagedoorn & Duysters, 2002; Insigna, 2000; Lynskey, 1999; Quinn, 1999, 2000; Sanchez, Heene, & Thomas, 1996). This research identifies the drivers, proposes required capabilities, map the timing of deployment, and investigate the acquisition of new capabilities as a build/buy decision, thereby offering a resource-based view of strategy development that explains and reconciles two models of strategy: one deliberate and one emergent.

Strategy and strategising

The strategy literature can be characterised by four broad approaches (**Error! Reference source not found.**): classical, processual, evolutionary and systemic (Galliers, Leidner, & Baker, 1999). These can be placed on a continuum representing processes ranging from deliberate to emergent (Whittington, 1997). Classical strategy and organisational theory proposes that organisations change by a rational route. Vision and strategy are formulated, then structure is changed to support the strategy. Last, resources, including skills and technology, are put in place to support the new structure. The classical approach is based on planning and control: managers perceive the need to change, this triggers dynamic capabilities that implement the change (Ambrosini et al., 2009). The evolutionary approach seeks to ensure survival, and attempts to optimise fit between the firm and its environment (Galliers et al., 1999). It views strategy as emerging from individual actions. For the processual school,

strategy is pluralistic in terms of outcomes, and is emergent. The systemic school, also pluralistic in outcomes, recognises the influence of culture, but is still rational and deliberate in approach (Galliers et al., 1999; Whittington, 1997).

Insert figure 2 here

During entry into new strategic areas, and in the use of new technology, organisations seek to gain and sustain competitive advantage (Penrose, 1959). Sources of competitive advantage can reside within the organisation, or externally up or down the value chain (Insigna, 2000; Quinn, 1999). The prevailing paradigm for understanding how organisations develop and sustain competitive advantage is the resource-based view of the firm (Ambrosini & Bowman, 2009; Arend & Lévesque, 2010; Schendel, 1994). In the context of Figure 2, the RBV approach assumes a deliberate approach to strategising, whether profit maximising or pluralistic. This research considers how the RBV might be applied in an emergent/pluralistic context.

Resource-Based View of strategy

The RBV proposes that organisations are made up of teams of resources working together to provide the capability to perform some task (Penrose, 1959). Resources, at their most fundamental, are made up from basic units of production. Resources can be viewed as different combinations of the Schumpeterian (1934) building blocks of land and labour. All of a firm's outputs can be viewed as bundles of the services provided by resources, and it is the interaction between human and material resources that determines the productive services available from any given resource (Penrose, 1959; Schumpeter, 1934).

The RBV has been criticised as conceptually vague and tautological, failing to address mechanisms by which resources contribute to competitive advantage (Mosakowski & McKelvey, 1997; Priem & Butler, 2000; Williamson, 1999), as having insufficient empirical grounding (Priem & Butler, 2000; Williamson, 1999), and because sustainable competitive advantage is unlikely in a rapidly changing environment (D'Aveni, 1994). However, Arend and Lévesque (2010) model the RBV as dynamic rather than static, illustrate where superior

information is exploited to obtain key resources at attractive costs, and identify sources of competitive disadvantage.

RBV logic has also been criticised for being paradoxical, contradictory, and ambiguous. For example: if a capability can be measured it is less likely to be a source of competitive advantage; it is difficult to identify precisely what a capability is even though it is claimed to be useful for managers; and the problems in establishing causal links between resources and performance means managers have limited ability to understand sources of competitive advantage (Lado et al (2006). The most interesting variables in RBV research are the least identifiable and measurable (Grant, 1996). For capabilities to be sustainable they need to be difficult to identify, code, and imitate (Barney, 1991; Kogut & Zander, 1992) - qualities that make them hard to research or verify empirically (Godfrey & Hill, 1995). Yet, there has been empirical validation of the RBV that addresses some of these criticisms and demonstrates practical applicability of the theory (Arend & Lévesque, 2010; Kyrgidou & Spyropoulou, 2012).

Capabilities refer to an organisation's capacity to deploy resources using processes (Amit & Schoemaker, 1993). Amit and Schoemaker describe them as organisation-specific, information-based, tangible or intangible processes developed over time. They are intermediate goods that enhance productivity by combining physical, human, and technical resources. Capabilities reside within organisational members and are integrated into higher-order systems (Teece et al., 1997). Capabilities are the socially complex routines with which firms turn inputs into outputs (Collis, 1994).

Capabilities provide three sources of organisational heterogeneity (Collis, 1994). First, those with an ability to perform basic functional activities, such as marketing, brand management (Amit & Schoemaker, 1993), or operational excellence (Treacy & Wiersema, 1993). Second, those responsible for dynamic improvements, such as product innovation (Amit & Schoemaker, 1993); the ability to learn and adapt, or flexibility in product development (Hayes & Pisano, 1994). Third are '*more metaphysical strategic insights that enable firms to recognise the intrinsic value of other resources or to develop novel strategies before competitors*' (Collis, 1994:145). These include strategic development and the ability to

develop and deploy resources (Henderson & Cockburn, 1994). These are akin to Marshall's (1920) identifications of management as the fourth factor of production, to Schumpeter's (1934) entrepreneurial function, and to the creation of new production functions (Collis, 1994).

Dynamic capabilities, combinative capabilities (Kogut & Zander, 1992), architectural competences (Henderson & Cockburn, 1994), or simply capabilities (Amit & Schoemaker, 1993) consist of processes such as alliances, product development, and strategic decision making, that create, integrate, recombine, and release resources (Eisenhardt & Martin, 2000). They are processes that rearrange, or acquire new resources in response to environmental change (Ambrosini & Bowman, 2009; Eisenhardt & Martin, 2000; Teece et al., 1997). Dynamic capabilities can be viewed as incremental: routine improvement; renewing: modifying resource stocks; or regenerative: the renewal of the ability to modify resource stocks (Ambrosini & Bowman, 2009).

The terminology from the RBV literature used to discuss capabilities, dynamic capabilities and competences is inconsistent, sometimes contradictory and needs to be clarified (Ambrosini et al., 2009). Some researchers use the terms capability and competence interchangeably (Hamel & Heene, 1994). However, Penrose uses capability to describe the ability to produce some goods, or perform some services, but at a higher level than the individual goods themselves. Competence describes the capability to perform a task that an organisation can use to leverage into new markets (Penrose, 1959). This suggests that a competence is an ability to bundle services of resources, and that such an ability confers competitive advantage. Thus, although a capability may confer some benefit to an organization, possibly leading to advantage, a competence is differentiated from a capability by its ability to confer competitive advantage in terms of quality, innovation, price, location, or some other determining feature (Grant, 1998; McGee & Peterson, 2000; Prahalad & Hamel, 1990). There is some consensus that core competences are those that are scarce, best in class, difficult to imitate, and provide competitive advantage (Grant, 1998; Hamel & Heene, 1994; Segal-Horn, 1998). Thus a core competence is differentiated from a general competence by its scarcity, quality and uniqueness.

Capabilities and competencies are not static. The services generated by resources change as knowledge about resources is acquired, as new routines are developed, or as they are combined with other resources in new ways (Ambrosini et al., 2009). New resources and capabilities can be acquired that complement existing resources and capabilities. For different strategic types, different capabilities will be needed (DeSarbo, Benedetto, Jedidi, & Song, 2006).

Managing the acquisition and deployment of capabilities is, in itself, a capability (Ambrosini & Bowman, 2009). Research has focussed on the timing of deployment (Jarvenpaa & Leidner, 1998; Mintzberg & Westley, 2001; Montealegre, 2002) and the nature of dynamic capabilities (Ambrosini et al., 2009). Under the dynamic capability view the firm needs to develop the capability to identify new opportunities and respond quickly. Timing is important where different capabilities are required at different stages of entry to a new market or strategic area.

Technology-induced change

The contemporary organisational environment is one of unprecedented technological and organisational development, in which strategic initiatives go hand-in-hand with technology-induced organisational change. There are three perspectives of technology-induced change: planned change, technological imperative, and punctuated equilibrium (Orlikowski, 1996).

Planned change presumes managers are the primary source of change and that they deliberately initiate and implement change in response to perceived opportunities (Buckland, 2009). This perspective dominates the organisational change literature, but has been criticised for treating change as a discrete event that is managed separately from other organisational processes, and for assuming a predominant influence of managers (Pettigrew, 1985). By considering organisations as self-organising, constantly changing, and learning entities, change can be approached as a more integrated activity in which managers are less rational (McAulay, Russell, & Sims, 1997; Orlikowski, 1996; Simon, 1983).

The technological imperative perspective ascribes less discretion to managers. It views technology as a primary driver of change. Technology creates predictable changes in structures, routines and performance (Blau, McHugh-Fable, McKinley, & Phelps, 1976; Carter, 1984; Huber, 1990; Leavitt & Whistler, 1985). Orlikowski suggests this perspective is similar to the technological determinism evident in socio-historical studies (Winner, 1986), economic analyses (Heilbroner, 1967), and contemporary culture (Smith & Marx, 1994) which assumes that technology in itself can provide a fix. These approaches minimise the role of organisational actors in determining change at the micro-level, or in customising technology to suit local environments.

Punctuated equilibrium assumes change occurs in rapid, radical episodes, interspersed with periods of relative calm (Gersick, 1988, 1991; Mensch, 1979). Radical change episodes are triggered by new conditions such as new technology, new processes, or deregulation.

All three of these models assume the principal state of organisational stability, shifting from one stable form to another (Mintzberg, 1987), whereas some research points to organisations having non-stable organisational forms, processes, and technology (Orlikowski, 1996). The three perspectives do not distinguish explicitly between deliberate and emergent strategies, or focus on the actions of organisational actors, and therefore cannot account for emergent, technology-based organisational change (Orlikowski, 1996). A perspective of situated change that posits change rather than stability as the way of organisational life is presented by Orlikowski (1996) who questions the belief that organisational change must be planned (Tyre & Orlikowski, 1994), that technology is the primary cause of technology-based organisational transformation, and that radical change occurs rapidly and discontinuously. From the situated change perspective, organisational transformation originates in the day-to-day activities of organisational actors, is opportunistic, emerges from experimentation and accommodation to contingencies, breakdowns, exceptions, and the unintended consequences that are encountered (Orlikowski, 1996). Thus, organisational transformation may be considered as on-going improvisation enacted by actors responding to opportunities in a changing environment.

Research model

This research considers how the RBV might be applied in an emergent/pluralistic strategic context of technology-induced organisational change. While many HEIs have displayed exceptional survivability, they are criticised for their strategic approach with sector reviews recommending top-down strategic planning (Buckland, 2009). This research tests the proposition that organisations in such a situation will indeed follow a traditional approach to strategizing, in which: managers perceive the need to change; the stock of resources is then evaluated, and expanded to fill the resource gaps (Ambrosini & Bowman, 2009). In short, the challenge facing managers is to develop the strategic competencies that arise from the firm's resources (Segal-Horn, 1998). A firm must understand its resources and capabilities, and the resources and capabilities needed in order to develop strategy. An organisation must understand the resources and capabilities required, and its core competencies, in order to decide which resources are kept in-house and what is outsourced, the resources to acquire and how to acquire them, and of what resources to dispose: the build/buy decision. The model of acquisition of new capabilities, **Error! Reference source not found.**, forms the starting point of this research.

Insert figure 3 here

If the stock of capabilities is to be expanded through build/buy then decisions about how to expand must be made. New knowledge about existing resources and assets may provide new capabilities, or new resources and assets may be acquired, either by building them, or buying them from external sources.

The build/buy decision is a component of the decision to expand the resource stock. New capabilities can be generated internally through re-deploying existing resources in new ways (Grant, 1998), renewal by modifying resource stocks (Ambrosini et al., 2009); organisational learning in the form of training, R&D, and the development of new routines (Prahalad & Hamel, 1990; Salge & Vera, 2011), or through entrepreneurial activity (Hamel & Heene, 1994). They can be bought through purchaser/vender transaction, or through mergers and acquisitions (Hagedoorn & Duysters, 2002). The services provided by resources can be

acquired through outsourcing, but while capabilities may be outsourced, core competencies cannot be, since core competencies are those that not only provide competitive advantage, but are competitively unique. Resources and capabilities can be shared or transferred through alliances with other organisations (Duysters & Hagedoorn, 2000).

It is often difficult to acquire resources externally when they are a peculiar to an organisation and therefore difficult to imitate or learn. According to Kogut and Zander (1992), coded knowledge is easier to acquire, and easier to transfer for exploitation. If knowledge is embedded in organisational structures it can be acquired through mergers and acquisition, absorbed through close association with alliance partners, or shared.

Where resources are acquired externally the risk of unintended transfer of resources in the form of technology, skills or routines, influences the choice of mode of acquisition. Where there is a high risk of transfer, and weak protection in the form of intellectual property rights, merger and acquisition is appropriate (Hagedoorn & Duysters, 2002). Where new knowledge expires quickly, and timely learning is more important than control, or where there is a high degree of protection, alliances are more appropriate. Where resources are not core, those resources may be outsourced.

Once acquired, new resources and capabilities must be embedded so that they become a part of organisational routines and knowledge (Grant, 1998), capabilities must be repeatable and embedded (Helfat & Peteraf, 2003). Knowledge is socially-constructed, residing in the organising of its relationships, the coding of knowledge, and by the higher-order principles governing organising (Kogut & Zander, 1992). New knowledge is built into existing resources and developed by combining existing resources in new ways (Schumpeter, 1934).

Research context

The context for this research is E-learning in higher education. E-learning involves using digital technologies for teaching and learning (Katz & Oblinger, 2000) and brings about a need for new skills in the use of digital media (Laurillard, 1993; Salmon, 2000). E-learning can involve distance learning, or a mix of face-to-face and online learning: blended learning.

Virtual learning environments (VLEs), and managed learning environments (MLEs) can have significant impact upon learning and teaching strategies, and upon the organisation (reference removed for review). This research examines the exploitation of e-learning in UK universities. As universities use e-learning they will require new capabilities; they may be developing new products, entering new markets, and undergoing transformational change. Thus e-learning development in universities provides a source of case organisations that are undergoing technology induced change and presents an opportunity to test the rational stepwise view of the strategy process depicted in the RBV literature.

E-learning can be viewed as a bundle of capabilities that are also used in the production of other products. One example is the network infrastructure required to provide access to e-learning tools, but it is also used for services such as delivering campus-wide file stores, intranet and Internet services. Further, although e-learning programmes require design, the capability to design learning programs applies to all learning programmes, not just e-learning programmes.

However, e-learning brings about a need for new skills in the use of digital media for teaching and learning (Laurillard, 1993; Salmon, 2000), and blurring of old roles, such as academic and librarian, along with new specialist roles for staff (Timmis, 2003). It also brings about new configurations of teaching and learning institutions, and an unbundling of services as the boundaries between HEIs and other e-learning service providers becomes blurred (Ferguson, 2000; Katz & Oblinger, 2000). Thus, HEIs need to acquire new capabilities and competences to engage in e-learning because new skills are required (Laurillard, 1993; Salmon, 2000; Timmis, 2003; Ward & Newlands, 1998). E-learning, in its more complex forms, may change processes and products, open up new market opportunities, and bring about organisational change. Such use may therefore be characterised as strategic.

The use of e-learning by HEIs is an opportunity to study the internal/external acquisition of resources decision and its place in capability development, as HEIs make decisions about resource acquisition. Universities may be viewed as loose coupled professional organisations where strategy might be enacted by teams, individuals or segments (Buckland, 2009) and thus emergent strategy might be identified. What is more, a decision to

engage in alliances, or outsourcing, is a part of the acquisition of the new resources decision, and literature on e-learning suggests that this will occur as HEIs adopt e-learning (Bates, 2001; Bjarnason et al., 2000; Katz & Oblinger, 2000; Sims, Powell, & Vidgen, 2002).

The capability to acquire and deploy resources is critical for improving organisational performance (Ambrosini & Bowman, 2009), and such capabilities can stimulate the adoption of new technology, processes and ideas (Kyrgidou & Spyropoulou, 2012). For e-learning to be an institutional competence, the HEI must perform e-learning activities exceptionally well, in a way that allows it to enter new markets and derive competitive advantage, and for it to be a core competence e-learning must be performed in a way that competitors cannot easily imitate.

If the services required for e-learning are generated by existing resources, or if the new resources are related to, and complement, existing resources and capabilities in a university, then it would be reasonable to expect that the university would be able to develop an e-learning capability, or even an e-learning competence.

However, identifying capabilities and competencies is difficult (Easterby-Smith et al., 2009; Walsh & Linton, 2001) and operationalising them even more so (McGee & Peterson, 2000; Walsh & Linton, 2001). According to Rothwell and Lindholm (1999) capabilities are made up from the skills, abilities and expertise of groups of individuals within an organisation. Thus, individual competencies are collectively aggregated into organisational competence. Rothwell and Lindholm argue that competency models are often narrative descriptions of job competencies for a group, job category or department, describing the key characteristics required for exemplary performance.

Research design

Case studies deploying semi-structured interview have been used to collect RBV narratives (Marino, 1996; Montealegre, 2002). While case study allows the capture of detail and the analysis of many variables, the method is criticised for difficulty of generalisation (Galliers, 1994). However, when using case study, researchers are not necessarily looking for

generalisation from a sample to a population, but rather for plausibility and logical reasoning when describing the results and drawing conclusions from them (Walsham, 1993).

This research adopts the methodology proposed by Rouse and Daellenbach (1999). They suggest that positivist methodology will not unambiguously identify capabilities and competencies, and propose a qualitative approach, examining high and low performing organisations by gathering rich data from ethnographic and interpretive study. They offer a four step process for selecting a sample. The first step involves ranking cases in the selected industry, here higher education. The second step is to cluster firms using at least two typologies to support the cluster, with the suggestion of using Herbert and Deresky's (1987) approach. This study selects public universities in the UK, (grouped by commonalities such as funding sources, quality assessment regime, and student selection, but different from other HEIs such as private universities, higher education institutes, or university colleges), and the Herbert and Deresky classification, based on the Ansoff (1965) growth vector, classifying the selected sample as having a 'develop' strategy. The third step is to compare performance indicators looking for differences in performance. The final step is to identify high and low performers using the indicators.

Here, the performance indicators are the Times' Good University Guide and the results of the Government-imposed Research Assessment Exercise in 2008 (RAE, now superseded by the REF), used to rate universities by relative performance. The Guide rates universities by a number of performance measures and is a popular tool for students, school careers advisors, and parents in choosing a university. The validity, or appropriateness of the rating in the Guide is not debated here, nor the appropriateness of students' use of such ratings, merely that it is used by students and that universities are conscious of their ratings and seek to improve them. The RAE is a rating tool used by Government to determine the perceived quality of research conducted by universities, forming the basis on which Government decides public funding levels for research. There are a number of performance indicators measured by the RAE, and, again, the validity of the RAE is not taken up by this research, nor the appropriateness of performance measures used by the RAE, or the appropriateness of using such a rating exercise for determining funding, merely that it is used by the Government for such a purpose, and that universities seek to compete for funding on

the basis of improving their performance in the RAE.

Two cases in the sample were in the upper quartile of both the Times' and the RAE rankings while one was in the lower quartile. Rouse and Daellenbach argue that selecting out the central group allows a more stark comparison of differences. However, this study also chooses two further cases. One is not in either ranking, but is a renowned innovator and user of e-learning, another is in the middle of the ranking of both indicators. These further cases are used to add richer data to the study. In total, five UK HEIs were chosen for study, each case is a research and teaching institution with undergraduate, and taught and research postgraduate courses (**Error! Reference source not found.**).

Insert table 1 here

Individual actors within the HEIs were interviewed to gather narratives about strategy and to identify capabilities. The interview questionnaire Marino (1996) developed to identify competences in group interviews within organisations is synthesised with the Walsh and Lynton (2001) framework, and is employed here. Principal actors in each case were identified from analysis of staff directories and subsequently interviewed. The interviews were semi-structured, allowing freedom for discussion to develop. Their objective was to gather data to aid in identifying: capabilities and competencies required for e-learning; which of these were new; from where the new capabilities and competencies were acquired; and when they were deployed. Several interviewees were chosen in each case to provide multiple sources to support results. Interviewees from academic, educational technology, and management domains within each case were chosen, whose web profiles indicated they held senior positions, were members of institutional decision-making committees, e-learning researchers, teaching using e-learning, or learning technologists teaching academic staff how to use e-learning. Further interviewees were identified by asking interviewees to recommend additional interview candidates (snowballing). All interviewees discussed the use of learning technology in terms of what they perceived to be the most important elements of its use, and the implications of use.

Interviews were recorded and transcribed, detailed notes were also taken at the time of

interview. Transcriptions were then coded and entered into NVivo to aid analysis. The themes identified in the literature review (**Error! Reference source not found.**) were used to guide the initial coding in NVivo.

Insert table 2 here

The themes were used to guide the analysis of the transcripts of the interviews. In some instances subjects made clear statements that were used to identify areas of importance; in others themes emerged from the data where subjects identified issues, processes and capabilities. Themes were supported by more than one subject, and, where possible, all were triangulated against several interviewees. For example, where numerous subjects stated that their institution did not have a strategy for e-learning, but there were plans to write one, or they were in the process of writing one, this was taken as evidence that e-learning was not being developed according to a strategic plan. This was then triangulated against statements that identified the development of e-learning as being the result of the actions of individual academics and technologists experimenting with e-learning, which suggests that there is no enacted strategy in place, but that there are moves to develop one as a result of on-going activity: an emergent strategy.

Findings

The software used by the five cases is listed in **Error! Reference source not found.** This is not an exhaustive list, but includes commercial off-the-shelf systems (COTS) software packages. All cases had some bespoke software, some written in-house, some outsourced.

Insert table 3 here

The capabilities required for e-learning are summarised in **Error! Reference source not found.** Some are general e-learning capabilities, some specifically for local or distance learning. The order of capability deployment and the capability mix, differ depending on the approach to strategy development. In **Error! Reference source not found.** ‘Y’ represents the presence of a capability, and ‘N’ absence. This is, however, a rather crude description and needs to be understood as ‘substantial presence’ or ‘substantial absence’. In some instances apparently mutually exclusive behaviours contributing to apparently mutually exclusive

capabilities existed simultaneously, such as staff buy-in as a result of academic freedom and management of academic activity as a result of lack of academic freedom. However, where such paradoxes exist, the degree of presence of behaviour is hard to determine, but nevertheless affects organisational activity.

A need for strategy is quite clear to most subjects, but surprisingly, for some cases its role is to follow entry to the new area, not to precede it. Subjects in ex-post cases made statements such as *'no, we don't have a strategy, but we are starting to write one'*, and where there was a strategy *'no, I don't think anyone would know what was in it'*. There was an assumption in ex-post cases that a strategy would be needed to legitimise what had already taken place. Subjects in ex-ante cases made statements such as *'there was a definite strategic decision... you will develop an on-line [course]'*, and *'certainly there was a strategic directive'*, and believed it to be top-down decision making.

Insert table 4 here

Error! Reference source not found. identifies two approaches to perception of opportunity; one is of teaching and learning opportunities, the other business opportunity. In some cases both forms of perception exist, but in others it is principally just one. Perception of teaching and learning opportunity leads to experimentation in using technology for teaching and learning. Perception of business opportunity leads to the development of business strategy before implementation of e-learning: ex-ante strategising. In cases with both perceptions, experimentation and the development of business strategy occurred.

Experimentation took place in organisations with strong research cultures, where there are skills in experimentation, and where there is little evidence of top-down strategy but freedom for academics to pursue their own interests. This could be viewed as the loose coupled professional organisations described by Buckland (2009) with strategy being enacted by teams and individuals. Where both experimentation and the development of business strategy occurred, subjects report disputes and tension between the two. In ex-ante strategising organisations academic activity is tightly controlled with less academic freedom, and managing academic activity is seen as an important part of implementing strategy. This could be viewed as Ambrosini et al's (2009) strategy developed by managers in response to

perceptions of the need to change. In experimental organisations the higher levels of academic freedom and buy-in, as opposed to control of, academics, is important. The capability “can build buy-in by academic staff” is used to differentiate those organisations that can create – or already possess - consensus about how the technology is exploited from those that impose strategy in a top-down manner. It is a capability because it enables a qualitatively different approach to technology exploitation (the ability to create buy-in) than where technology exploitation is deployed in a command and control manner with little concern for buy-in. In both models staff training is a vehicle to spread knowledge and skills. Similarly the ability to invest in and manage new technology is important in both, as is the need to re-engineer teaching and learning as more complex forms of e-learning required different teaching and learning models. The need to integrate systems is common as learning technology offers opportunities for increased efficiency through integration, but without integration it was awkward and cumbersome.

Identifying and managing new partners is only important for organisations with significant partners, and just those organisations implementing distance learning in a substantive way have such strategic partners. Although all cases engage in some form of distance learning, for two cases it is not a priority. Business process redesign is also only important for distance learning organisations. Even where the organisation has a history of distance learning the use of e-learning creates new relationships between institution and student, student and student, and institution and strategic partners, and in some cases a direct relationship between student and strategic partner.

Only the experimental organisations are starting to develop strategy following substantial development of e-learning, i.e., the ex-post strategy model. In these cases strategy is seen as important to legitimise prior activity.

The capability mix required to implement e-learning differs according to the strategic approach (Table 5). The outcome of the build/buy decision for acquisition of new capabilities also differs according to the strategic approach (Table 6).

New resources are built into new capabilities; the new resources are sourced internally

or externally, capabilities may be internal or external (Table 6). Three capabilities - staff development, management of systems integration, and management of technology investment - are common to both strategy models, while the most critical information systems, the overall managed learning environment and its accompanying virtual learning environment, are sourced externally and thus probably not components of core competencies. The capability to re-engineer teaching and learning is treated differently in the two models. The ex-ante approach treats only curriculum design and control as core while acquiring content development, delivery and software development from partners. The ex-post cases treat curriculum design and control as well as content development and delivery as core, all of which is developed internally, along with some of the e-learning software development.

Insert table 5 here

Insert table 6 here

DISCUSSION

In addressing the first research question, the process of strategy development when exploiting new technology, the findings here point to two distinct models of strategy with differing capability mixes. These can be viewed as idealised models at either end of a strategic approach continuum. One follows the logical stepwise progression through perceived opportunity, ex-ante strategy formulation with decision to enter the new strategic field, evaluation of existing resources and capabilities, followed by resource gap analysis, acquisition of new resources with build/buy decision, and implementation of strategy. This is a top-down approach that largely confirms the model in **Error! Reference source not found.** However, there are important actors at different levels who take the role of change 'champions' pushing for implementation of new technology. These provide an up-flow that feeds into the top-down approach. The second model is less organised, less prescriptive and more exploratory. It follows the path of exploration by experimentation, resource acquisition focusing on skill development, building routines, followed by embedding by extending buy-in by staff, staff training, and legitimising by ex-post strategising. This second model - the ex post approach to strategy - is depicted in **Error! Reference source not found.**

The second research question asks at what stage new capabilities and competencies are acquired when exploiting new technologies. The two models for e-learning implementation use different capabilities and these are deployed at different times. For the ex-ante strategy model, the first phase requires the capability to recognise an opportunity, followed by the capability to strategise and plan, and to agree on that strategy and plan. In order to implement the plan a capability to identify external partners is required. A staff development capability is needed so that there are those with the knowledge and skills needed to carry the strategy forward. In the second phase, there is increased investment in technology, with choices to be made about what technology to use. This represents a need for a capability to manage technology investment. As the new technology is implemented, new routines are needed, and thus the capability to re-engineer routines is deployed. As external partners are used, the capability to engage and manage external partners is deployed. The supply chain is unbundled as external partners take on a critical role in supplying new resources, such that the capability to engage in business process redesign starts to be deployed as a consequence of implementing the plan, rather than as an articulated intention of the plan.

Insert figure 4 here

For the ex-post strategy model the first capability to be deployed is the ability to recognise opportunities from the new technology, then learning to exploit them through experimentation. Experimentation is both a driver, as organisational actors seek opportunities to experiment with new technology, and a capability requiring skills and knowledge about how to experiment. A learning capability, as staff are trained in the use of the new technology, is deployed in the first phase. As a result of experimentation and the use of new technology a need to integrate new and existing information systems is uncovered, and the capability to manage systems integration is deployed. The second phase is not easily demarcated into a distinct time period as it is entered into gradually as need arises. It involves a widening buy-in by staff, which can be described as a capability to absorb new processes and develop new routines. As with the ex-ante strategy model there is an investment in technology, with choices to be made about what technology to use, and a capability to manage technology investment is deployed, as is the capability to re-engineer organisational routines. This may lead to business process re-design, but that is unclear, and the loose structures in the

institutions following the ex-post strategy model may be flexible enough not to require formal business process re-design.

The third research question asks how new capabilities and competencies are acquired when exploiting new technologies. The data identifies three new capabilities (**Error! Reference source not found.**) together with their mode of acquisition. The capability to re-engineer teaching and learning is acquired in ex-ante strategising organisations by developing in-house new resources: *course design* and *curriculum control* for e-learning. A different re-engineering teaching and learning capability is acquired by the ex-post strategising organisations by developing the resources in-house: *course design; curriculum control; content development; delivery*, as well as some *development of e-learning software*. The third capability of *managing external partners* is acquired by the ex-ante strategising organisations through the resources e-learning software development, content development, and content delivery. These resources are acquired externally and internally. Where they are core resources, they are acquired from strategic partners, but where they are acquired from strategic partners the ability to manage partners is required and is developed in-house.

Implications: the ex-ante and ex-post continuum

The two models of entry to a new strategic area can be viewed as idealized types at each end of a continuum (**Error! Reference source not found.**). Here two cases fall towards one end of the continuum and one towards the other end, while two are situated more centrally, exhibiting aspects of both models. Determining exact positioning between the idealised end models for any particular case requires the development of assessment and measures of strategic approach. The ex-ante and ex-post models fall along the deliberate/emergent axis used by Whittington (1997) to differentiate strategic planning approaches. This study finds the ex-ante model to be characterised by top-down decision-making, typical of the rational/deliberate approach, while the ex-post model is experimental and self-organised, typical of the emergent approach. The presence of two cases in the middle of the continuum that have a balance of ex-post and ex-ante approaches, whether by chance or by design, suggests that the two approaches need not be mutually exclusive. It might also be that the different cases represent organizations that are in different stages of cyclic strategy

development. Organisations might deliberately take a both/and approach to strategising rather than an either/or. The need to address exploitation and exploration jointly is covered in much depth in the literature on ambidexterity (see Raisch, Birkinshaw, Probst and Tushman (2009) for example) and there are applications of this mode of thinking to strategic planning, in which organisations explicitly and deliberately seek to achieve an appropriate balance of ex-ante and ex-post approaches in order that strategy be both planned and emergent.

Insert figure 5 here

Conclusion

The research finds that there are two ideal models of strategy development: one rational stepwise, the other emergent, relying on experimentation as the main driver for exploitation of new technologies (**Error! Reference source not found.**), ex ante and ex post are extremes of a continuum and therefore ideal types (figure 5). The two models for e-learning implementation make use of different capabilities, and these are deployed at different times, confirming the view of dynamic capabilities. Capabilities for both models may be acquired internally or externally, but with the ex-post model core capabilities are acquired internally through experimentation, and strategy is used as a legitimising process to confer organisational acknowledgement of what has already been accomplished.

Insert table 7 here

The determination of experimentation as the principal means of implementing emergent technology-based organisational change supports the situated change perspective (Orlikowski, 1996). It is in the day-to-day activities of practitioners that opportunistic change emerges from experimentation. This research places that view of change in the resource-based view of the firm. This research also suggests that firms might deliberately take an ambidextrous approach and seek a balance of planning and emergence in their strategy process (S. Raisch et al., 2009).

There are limitations to this research. Although subjects recounted past activities, and

speculated about future activities, it is not a longitudinal study. Recounting of past activities is helpful, but memories may be biased, and speculation about future activities is more important for interpreting current attitudes than for prediction. There is evidence that timing of deployment is important, and future research needs to examine this. E-learning may act as a change agent, just as in previous waves of computerisation where localised exploitation has led to transformational change - e-learning may similarly bring about such transformation. There is an opportunity for further research to examine technology exploitation in a longitudinal multiple case study to determine the extent to which organisations maintain or change their strategic approach over time, moving between ex-post and ex-ante. It is also important to replicate this research in other types of public institutions as well as private firms.

References

- Ambrosini, V., & Bowman, C. 2009. What are dynamic capabilities and are they a useful construct in strategic management? *International Journal of Management Reviews*, 11(1): 29-49.
- Ambrosini, V., Bowman, C., & Collier, N. 2009. Dynamic Capabilities: An Exploration of How Firms Renew Their Resource Base. *British Journal of Management*, 20: S9-S24.
- Amit, R., & Schoemaker, P. J. H. 1993. Strategic assets and organizational rent. *Strategic Management Journal*, 14(1): p33-46.
- Ansoff, I. H. 1965. *Corporate Strategy*: McGraw-Hill, Inc.
- Arend, R. J., & Lévesque, M. 2010. Is the Resource-Based View a Practical Organizational Theory? *Organisation Science*, 21(4): 913-930.
- Barney, J. 1991. Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1): 99-121.
- Bates, A. E. 2001. *Strategies for the Future*, Vol. 2001: The University of British Columbia.

- Bjarnason, S., Davies, J., Farrington, D., Fielden, J., Garrett, R., Lund, H., Middlehurst, R., & Schofield, A. 2000. *The Business of Borderless Education: UK perspectives*. London: Higher Education Funding Council for England and Universities UK.
- Blau, T., McHugh-Fable, C., McKinley, W., & Phelps, T. 1976. Technology and Organization in Manufacturing. *Administrative Science Quarterly*, 21: 20-40.
- Buckland, R. 2009. Private and Public Sector Models for Strategies in Universities. *British Journal of Management*, 20: 524-536.
- Carter, N. M. 1984. Computerization as a Predominate Technology: Its Influence on the Structure of Newspaper Organizations. *Academy of Management Journal*, 27: 247-270.
- Collis, D. J. 1994. Research Note: How Valuable Are Organizational Capabilities? *Strategic Management Journal*, 15(Special Issue: Competitive Organizational Behaviour): 143-152.
- D'Aveni, R. A. 1994. *Hypercompetition: Managing the Dynamics of Strategic Maneuvering*. New York: Free Press.
- DeSarbo, W. S., Benedetto, A. C. D., Jedidi, K., & Song, M. 2006. Identifying Sources of Heterogeneity for Empirically Deriving Strategic Types: A Constrained Finite-Mixture Structural-Equation Methodology. *Management Science*, 52(6): 909-924.
- Duysters, G., & Hagedoorn, J. 2000. Core Competencies and Company Performance in the World-Wide Computer Industry. *Journal of High Technology Management Research*, 11(1): 75-92.
- Easterby-Smith, M., Lyles, M. A., & Peteraf, M. A. 2009. Dynamic Capabilities: Current Debates and Future Directions. *British Journal of Management*, 20: S2-S8.
- Eisenhardt, K. M., & Martin, J. A. 2000. Dynamic Capabilities: What Are They? *Strategic Management Journal*, 21(10/11, Special Issue: The Evolution of Firm Capabilities): 1105-1121.
- Ferguson, N. 2000. Front Page - Weekend FT, *Financial Times*: 1. London.

- Galliers, R. D. 1994. Choosing information systems research approaches. In R. D. Galliers (Ed.), *Information systems research: issues, methods and practical guidelines*. Oxford: Alfred Waller.
- Galliers, R. D., Leidner, D. E., & Baker, B. S. H. 1999. *Strategic Information Management* (2 ed.). Oxford: Butterworth-Heinemann.
- Gersick, C. J. 1988. Time and Transition in Work Teams: Toward a New Model of Group Development. *Academy of Management Journal*, 31(1): 9-41.
- Gersick, C. J. 1991. Revolutionary change theories: a multilevel exploration of the punctuated change paradigm. *Academy of Management Review*, 16: 10-36.
- Godfrey, P. C., & Hill, C. 1995. The problem of unobservables in strategic management research. *Strategic Management Journal*, 16: 519-533.
- Grant, R. M. 1996. Prospering in dynamically competitive environments: Organizational capability as knowledge integration. *Organization Science*, 7(4): 375-386.
- Grant, R. M. 1998. The Resource Based Theory of Competitive Advantage: Implications for Strategy. In S. Segal-Horn (Ed.), *The Strategy Reader*. Oxford: Blackwell.
- Hagedoorn, J., & Duysters, G. 2002. External Sources of Innovative Capabilities: The Preferences for Strategic Alliances or Mergers and Acquisitions. *Journal of Management Studies*, 39(2): 167-189.
- Hamel, G., & Heene, A. 1994. *Competency Based Competition*. Chichester: John Wiley & Sons Ltd.
- Hayes, R. H., & Pisano, G. 1994. Beyond world class: The new manufacturing strategy. *Harvard Business Review*, 72: 77-86.
- Heilbroner, R. L. 1967. Do Machines Make History? *Technology and Culture*, 8: 335-345.
- Helfat, C. E., & Peteraf, M. 2003. The dynamic resource-based view: capability lifecycles. *Strategic Management Journal*, 24: 997-1010.
- Henderson, R., & Cockburn, I. 1994. Measuring competence? Exploring firm effects in pharmaceutical research. *Strategic Management Journal*, Winter Special Issue(15): 63-84.

- Herbert, T. T., & Deresky, H. 1987. Generic Strategies: An Empirical Investigation Of Typology And Strategic Content. *Strategic Management Journal*, 8: 135-147.
- Huber, G. P. 1990. A Theory of the Effects of Advanced Information Technology on Organizational Design, Intelligence, and Decision Making. *Academy of Management Review*, 15(1): 47-71.
- Insigna, R. 2000. Linking outsourcing to business strategy. *Academy of Management Executive*, 14(4): 58-71.
- Jarvenpaa, S. J., & Leidner, D. E. 1998. An Information Company in Mexico: Extending the Resource Based View of the Firm to A Developing Country Context. *Information Systems Research*, 9(4): 342-362.
- Katz, R. N., & Oblinger, D. G. 2000. *The "E" is For Everything: E-Commerce, E-Business, and E-Learning in the Future of Higher Education* (1 ed.). San Francisco: Jossey-Bass Inc.
- Kogut, B., & Zander, U. 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, 3(3): 383-397.
- Kyrgidou, L. P., & Spyropoulou, S. 2012. Drivers and Performance Outcomes of Innovativeness: An Empirical Study. *British Journal of Management*, .
- Lado, A. A., Boyd, N. G., Wright, P., & Kroll, M. 2006. Paradox and Theorizing Within the Resource-Based View. *Academy of Management Review*, 31(1): 115-131.
- Laurillard, D. 1993. *Rethinking University Teaching*. London and New York: Routledge.
- Leavitt, H. J., & Whistler, T. L. 1985. Management in the 1980's. *Harvard Business Review*, 36: 41-48.
- Lynskey, M. J. 1999. The Transfer of Resources and Competencies for Developing Technological Capabilities - The Case... *Technology Analysis & Strategic Management*, 11(3): 317-337.
- Marino, K. E. 1996. Developing Consensus on Firm Competencies and Capabilities. *Academy of Management Executive*, 10(3): 40-52.

- Marshall, A. 1920. *Principles of Economics*. London: Macmillan.
- McAulay, L., Russell, G., & Sims, J. 1997. *Inside financial management*. London: CIMA Publishing.
- McGee, J. E., & Peterson, M. 2000. Towards the Development of Measures of Distinctive Competencies among Small independent Retailers. *Journal of Small business Management*, 38(2): 19-34.
- Mensch, G. 1979. *Stalemate in Technology*. Cambridge, MA: Ballinger.
- Mintzberg, H. 1987. Crafting Strategy. *Harvard Business Review*: 66-75.
- Mintzberg, H., & Westley, F. 2001. Decision making: It's Not What You Think. *Sloan Management Review*, 42(3): 89-93.
- Montealegre, R. 2002. A Process Model of Capability Development: Lessons from the Electronic Commerce Strategy at Bolsa de Valores de Guayaquil. *Organisational Science*, 13(5): 514-531.
- Mosakowski, E., & McKelvey, B. 1997. Predicting rent generation in competence-based competition. In A. Heene, & R. Sanchez (Eds.), *Competence-based strategic management*: 65-85. Chichester: Wiley.
- Orlikowski, W. J. 1996. Improvising Organizational Transformation Over Time: A situated Change Perspective. *Information Systems Research*, 7(1): 63-92.
- Penrose, E. 1959. *The Theory of The Growth of The Firm*. Oxford: Basil Blackwell & Mott, Ltd.
- Peteraf, M. 1993. The Cornerstones Of Competitive Advantage: A Resource-Based View. *Strategic Management Journal*, 14: 179-191.
- Pettigrew, A. M. 1985. *The Awakening Giant*. Oxford: Blackwell Publishers.
- Prahalad, C. K., & Hamel, G. 1990. The Core Competence of the Corporation. *Harvard Business Review*, 68(3): 79-92.

- Priem, R. L., & Butler, J. E. 2000. Is the resource-based 'view' a useful perspective for strategic management research? *Academy of Management Review*.
- Quinn, J. B. 1999. Strategic Outsourcing: Leveraging Knowledge Capabilities. *Sloan Management Review*, 40(4): 9-22.
- Quinn, J. B. 2000. Outsourcing Innovation: The New Engine of Growth. *Sloan Management Review*, 41(4): 13-29.
- Rothwell, W. J., & Lindholm, J. E. 1999. Competency identification, modelling and assessment in the USA. *International Journal of Training & Development*, 3(2): 90-106.
- Rouse, M. J., & Daellenbach, U. S. 1999. Rethinking research methods for the resource-based perspective: isolating sources of sustainable competitive advantage. *Strategic Management Journal*, 20(5): 487-494.
- S. Raisch, Birkinshaw, J., Probst, G., & Tushman, M. L. 2009. Organizational Ambidexterity: Balancing Exploitation and Exploration for Sustained Performance. *Organization Science*, 20(4): 685-695.
- Salge, T., & Vera, A. 2011. Small steps that Matter: Incremental Learning, Slack Resources and Organizational Performance. *British Journal of Management*.
- Salmon, G. 2000. Computer Mediated Conferencing for Management Learning at the Open University. *Management Learning*, 31(4): 491-502.
- Sanchez, R., Heene, A., & Thomas, H. 1996. *Dynamics of Competence-Based Competition: Theory and Practice in the New Strategic Management*. London: Pergamon Press.
- Schendel, D. 1994. Introduction to 'competitive organizational behaviour: toward an organizationally based theory of competitive advantage'. *Strategic Management Journal*, 14: 1-4.
- Schumpeter, J. 1934. *The Theory of Economic Development*. Cambridge: Harvard University Press.
- Segal-Horn, S. 1998. *The Strategy Reader*. Oxford: Blackwell.

- Simon, H. A. 1983. *Reason in human Affairs*. Oxford: Basil Blackwell Publisher.
- Sims, J., Powell, P., & Vidgen, R. 2002. *2+2=3? E-Learning Strategies in HE*. Paper presented at the Proceedings of the UK Academy of Information Systems Conference, Leeds.
- Smith, M. R., & Marx, L. 1994. *Does Technology Drive History? The Dilemma of Technological Determinism*. Cambridge MA: MIT Press.
- Teece, D. J., Pisano, G., & Shuen, A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7): p509-533.
- Timmis, S. 2003. Embedding Learning Technology Institutionally: 1-2: Joint Information Systems Committee.
- Treacy, M., & Wiersema, F. 1993. Customer intimacy and other value disciplines. *Harvard Business Review*, 71: 84-93.
- Tyre, M. J., & Orlikowski, W. J. 1994. Windows of Opportunity: Temporal Patterns of Technological Adaptation in Organizations. *Organisation Science*, 5(1): 98-118.
- Walsh, S. T., & Linton, J. D. 2001. The Competence Pyramid: A Framework for Identifying and Analyzing Firm and Industry Competence. *Technology Analysis & Strategic Management*, 13(2): 165-178.
- Walsham, G. 1993. *Interpreting Information Systems in Organizations*. Chichester: John Wiley & Sons Ltd.
- Ward, M., & Newlands, D. 1998. Use of the Web in undergraduate teaching. *Computers & Education*, 31(2): 171-184.
- Wernerfelt, B. 1984. A Resource-Based Theory of the Firm. *Strategic Management Journal*, 5(2): 171-180.
- Whittington, R. 1997. *What is strategy - and does it matter?* London: International Thomson Business Press.

Williamson, O. E. 1999. Strategy research: Governance and competence perspectives. *Strategic Management Journal*, 20(12): 1087-1108.

Winner, L. 1986. *The Whale and the Reactor: A Search for Limits in an Age of High Technology*. Chicago Il: University of Chicago Press.

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