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How Corporations E-Source: From Business Technology Projects to Value Networks

Leslie P. Willcocks

*Warwick University Business School, Coventry CV4 7AL, UK
E-mail: willcockslp@aol.com*

Robert Plant

*Department of CIS, University of Miami, Coral Gables,
FL 33124, USA
E-mail: rplant@exchange.sba.miami.edu*

Abstract. *A 78 organization study in USA, Europe and Australasia throughout 1999–2001 finds a variety of practices in sourcing the development and running of technology and e-businesses in value networks. The paper points to trade-offs in e-sourcing decisions, not least between speed to the net, cost, and organizational learning. Leading and lagging practices are identified and the evolutionary paths organizations take are described and assessed. Outsourcing emerges as highly useful for specific purposes, but other ways of using the external market for e-business development can be more suitable for certain identifiable activities. The paper further discusses how external sourcing and partnering practices are increasingly being extended into the customer resource life-cycle, into supply chains and throughout value networks. Case examples are discussed and the strengths and weaknesses of their practices identified. The need to clarify core capabilities is demonstrated, and two matrices that facilitate effective e-sourcing decisions are developed to summarize the findings from the research.*

Key Words. *information technology, sourcing, e-business, networks, IT development*

Introduction

Throughout 1999–2001 we studied 78 major corporations and their business internet strategies in-depth, to identify the factors that distinguished leaders from laggards. Amongst all the organizations studied, it was clear that, as ever, strategic positioning meant little if it could not be implemented. We found that the major log jams being experienced throughout 1999–2001, amongst ‘bricks and mortar’ companies in particular

in their moves to e-business, stemmed from cultural, political and re-engineering issues and factors. Re-orientation of mind-sets and skills and the development of more focused strategy were taking place, but a massive re-engineering effort and integration of skills, processes and technology still remained (Plant, 2000; Willcocks and Plant, 2001, 2002). On the recorded experience of companies like Dell, Charles Schwab and Cisco Systems, this process could take two years or more (Pottruck and Pearce, 2000; Dell, 1999; Bunnell and Brate, 2000; see also Note 1).

Against this background, we have found that moves to e-business have been marked by the need for speed in the face of volatile competition, but also, during most of the study period, by the relative scarcity of requisite expertise and capability. Both have led companies to consider sourcing externally. In the specific area of IT the motive, even from mid-2000, has been to implement e-business projects swiftly using externally available expertise rather than bear the costs of delay and of developing new expertise internally. More generally, though, companies have recognised that strategic outsourcing of non-core activities such as logistics can be appropriately contracted to a specialist provider. From late 2000, we found economic downturn and renewed concern for cost containment reinforcing this conclusion in many of the corporations we researched. In the world of e-business, where supply chain integration is becoming more common, such sourcing decisions have been becoming a core activity of strategic management. In several respects then, e-sourcing can be a fundamental enabler of moves to

e-business, especially where it is about making the best use of the mix of internal and external suppliers throughout an organization's business processes.

However, our study finds that accomplishing effective e-sourcing is far from simple, and if not managed properly can result in competitive disadvantage. The problem set decomposes into two fundamental aspects we deal with in this paper. The first is: how can organizations effectively leverage external service providers to get their web-based and e-business projects in place on suitable time-scales to compete? The second aspect relates not to development but to utilizing e-sourcing principles for the strategic conduct of business, namely: 'how do we participate in strategic sourcing with business allies to more effectively compete on what has been called a 'coopetition' or 'core capabilities' basis? In this final section we will look at the types of sourcing criteria successful corporations apply. We also present, as a summary of our findings, two decision-making matrices for strategic e-sourcing.

Research Approach

The study was carried out in USA, Europe and Australasia throughout 1999–2001. We carried out semi-structured interviews with over 190 executives across 78 corporations. Each interview lasted from 45 minutes to two hours, and internal and published support documents were also collected. The study covered car manufacturers and retailers, technology suppliers, biotechnology companies, financial services including credit card, stock broking, insurance and banking firms, airlines, information providers, pharmaceutical companies, and energy utilities. It also included a range of retailers and service operations, for example Coles Myer, Levi Strauss, Dixons, UPS, Alamo, Ryder, Lennar, and also manufacturers, for example Lockheed and ElectroComponents. The study companies are detailed in Appendix.

The objective was to examine a variety of sectors to identify generic and sector-specific practices characteristic of organizations that lead, lag or otherwise in their use of web-based technologies. The study was much broader than just B2C, and also looked at B2B and development/sourcing practices. Note also that B2C is used throughout as shorthand and refers also to the potential for C2B, for example Priceline, Accompany, and C2C, for example E-Bay, though not all these companies were in our sample.

Criteria for 'leading' and 'lagging' included degree to which web-site applied across the customer resource life-cycle, degree to which B2C was achieving disproportionate market growth/ profitability or moving to profitability; extent to which customers were being attracted and retained; size of spend and expected returns on marketing and e-development; B2B and B2C position in sector and against competition. We gained some quantified measures of these in each case, but more often subjective judgements by respondents. It should be remembered that the sample was opportunistic and deliberately spread across sectors and across what we judged as differently performing organizations, and deliberate over-representation of what we thought to be leaders. With these criteria and qualifications, we found some 26 'leaders', 20 'laggards', and 32 medium performing organizations.

Sourcing Internet Implementation Capability

To make a mark in e-business it is essential to have access to Internet implementation capability. This usually means using some external sources for specific capabilities. This section focuses on securing such capability for internet development projects. Invariably any specific sourcing choice involves trade-offs. Fortunately, the sourcing of previous rounds of technology, together with the outcomes of outsourcing arrangements has been heavily, and empirically, researched (Rao, 1996; Nam, 1996; Gurbaxani, 1996; Slaughter, 1996).

Thus Lacity and Hirschheim (1993) and Lacity and Willcocks (1998, 2001) found large scale single supplier outsourcing particularly risky, and recommended shorter term (3–4 year) contracts with several suppliers. They also found circumstances where insourcing was a more effective option (Lacity and Hirschheim, 1996; Willcocks and Lacity, 1998). Other researchers have also pointed out the risks of outsourcing (see for example Earl, 1996; Strassmann, 1998), including that of strategic inflexibility (Weill and Broadbent, 1998), while still others have examined the conditions under which strategic outsourcing on a long-term basis might be effective (see for example Di Romualdo and Gurbaxani, 1998; Kern and Willcocks, 2001; McFarlan and Nolan, 1995). Economic and other rationales for IT outsourcing have been studied (for example Ang and Straub, 1998, Loh and Venkatraman, 1992), while a range of theoretical perspectives have been offered

that could be used for studying outsourcing arrangements (see Cheon et al., 1998; Hirschheim, Heinzl and Dibbern 2002; Kern and Willcocks, 2002; Jurison, 1995). There is also a useful literature on effective practices for post contract management (for examples only, see Feeny and Willcocks, 1998; Klepper, 1995; Klepper and Jones, 1998; Sobol and Apte, 1995).

However, while such previous work can give good grounding for IT sourcing practice, in the specific context of e-business, the nature and efficacy of different sourcing options has received all too little academic attention. The contribution of the present paper is to delineate which sourcing practices work well or badly, and why, in the specific context of moves to e-business.

Sourcing options need to fit into the larger picture of building an e-business. The desired outcome from conducting e-business is added value whether it be to paying customers or internal customers in other units (Porter, 2001; Seybold, 2001). Our research confirms much of what has been found in earlier work about the importance of leadership and corporate ownership (Slywotzky and Morrison, 2001; Kalakota and Robinson, 2001), business process integration of e-business with other core business processes (Carton, 2002; Ware et al., 1998), and robust and flexible technology infrastructure (Sauer and Willcocks, 2001; Weill and Vitale, 2001). Based on the present study, the fourth component necessary for Internet implementation capability is requisite sourcing of capabilities and skills.

The sourcing routes our organizations took consisted of one or a mix of four possible options:

- internal development—corporations created their Internet systems within the boundary of their organization,
- external development—corporations largely outsourced to third party management their systems and web-site development,
- selective sourcing—corporations combined partial outsourcing with some in-house development,
- insourcing (or ‘partnering’)—corporations selectively sourced, contracting external skills to work under in-house management, alongside in-house resources. Respondents referred frequently to this as ‘partnering’ by which they meant close working relationships rather than the more classic definition of ‘shared risk and reward based on win-win relationships’ (Lacity and Hirschheim, 1993). This insourcing/partnering approach has been found particularly

appropriate where the technology or its application is new, and where experience with the particular technology and its applicability in a business is lacking (Feeny, Earl, and Edwards, 1997). As we shall see, this last approach proved particularly effective amongst several of the leaders we studied, who required fast implementation together with high internal learning and skills building.

Sourcing E-Development: Four Routes

The central dilemmas for most organisations considering their sourcing options for e-business development were the trade-offs between speed to market, cost, and organizational learning. The seemingly fastest route to securing internet presence and capability—outsourcing—may well undermine the organizational need to build up internal understanding. The concern to develop internal knowledge is driven by anxiety that Internet-based business processes will be fundamental in the future. As finances tightened, and the external labour market became less tight from mid-2000, the question as to what the cost implications were of different sourcing options also came much more to the fore. In this section, we look at how leading organizations, as we defined them (see above) dealt with these dilemmas.

Fig. 1 provides a framework for selecting appropriate sourcing options based on the drivers of speed, cost and learning. In addition to these four options, companies may choose to mix their sourcing, either selectively sourcing or changing their sourcing options over time (see Alamo example in the ‘The Outsourcing Path’ section below).

The in-house development path

In our research, companies going successfully down this route included UPS, Motorola, Direct Line, Citicorp, Meritanordbanken, and Dow Jones. The primary determinant of internal development was a credible project champion, usually an executive officer or CIO, who oversaw the “Internet development group”. Success via this route was assisted by high level project sponsors who created space, facilitated the necessary budget and resources to get off the ground, and protected the project at all times. Typically a project champion provided and sustained the vision and the motivation to the project, and the political influence needed to move it forward. Such

<p style="text-align: center;"><u>Outsource</u></p> <p>Advantages</p> <ul style="list-style-type: none"> • Taps into existing expertise • Variety of external services offered • Quickly get up to speed <p>Disadvantages</p> <ul style="list-style-type: none"> • Does not immediately facilitate internalization of learning • Builds vendor expertise, not yours • Vendors may not be skilled in organizational processes • Organization may lack basic infrastructure • Requires in-house skills to manage the supplier • Cost (includes vendor profit margin) • Ensuring technological alignment with strategic alignment • Co-ordination of content owners? 	<p style="text-align: center;"><u>Insource/Partner</u></p> <p>Advantages</p> <ul style="list-style-type: none"> • Taps into existing expertise • Wider variety of external services on offer • Quickly get up to speed • Share/build expertise with vendor • Facilitate internalization of learning • Organization can focus upon other e.g infrastructure issues <p>Disadvantages</p> <ul style="list-style-type: none"> • Requires in-house skills to staff and manage the project – availability? • Requires business managers’ commitment to achieve business and technology alignment • Contract management costs to coordinate project
<p style="text-align: center;"><u>‘Cheap-Source’</u></p> <p>Advantages</p> <ul style="list-style-type: none"> • Low investment • Low internal effort and resources • Gains from a ‘follower’ Internet strategy <p>Disadvantages</p> <ul style="list-style-type: none"> • Little internal learning, or from market • Functional only in relation to a specific type of business strategy • Does ‘followership’ pay with Internet applications? 	<p style="text-align: center;"><u>Internal Development</u></p> <p>Advantages</p> <ul style="list-style-type: none"> • Internalize organizational learning • Understanding of organization’s processes and integration issues • Understanding of internal IT infrastructure <p>Disadvantages</p> <ul style="list-style-type: none"> • Opportunity cost of mistakes • First mover expense • Scarce IT skills resources may inhibit Development • Will the business side commit necessary resources?

Fig. 1. Four sourcing options for e-development.

projects were often dubbed “skunk works” by their developers. Interestingly, there is strong support for this approach being effective in more traditional business technology projects, though organizations have frequently not adopted it (Feeny, Earl, and Edwards, 1997; Earl, 1998).

We found a clear example of the ‘skunk works’ internal development route can be found at stockbroker Charles Schwab. Upon seeing a browser-based demonstration of the company’s traditional trading system, the co-CEOs created, protected and nurtured a new stand-alone internet development group in order

to acquire, learn and adapt the technology to their needs. Ultimately recreating the company based upon internet technologies, Charles Schwab became, by 2000, the largest on-line brokerage company in the world.

Early movers used the skunk works teams to focus initially on organizational learning, gathering experience with the new medium, assessing the costs of development, the nature of the technology and its platform. This tied in with the organization’s ability to determine which technologies were worth pursuing early on, and which were not. Many of the skunk works projects

were funded from R&D budgets, initially at low cost. A power utility executive also took this approach in 1995:

we knew that we had to have a vanity page, the static stuff out there but we knew that we needed to understand from an IT perspective ‘how do you make it more active?’

The second step on the internal development route was to build a strong technology infrastructure. Seen as the key to technological and organizational flexibility by many CIOs and executives, the IT infrastructure was critical to the successful transition of the Internet presence from the static to the dynamic. The correct infrastructure can be defined as one facilitating the implementation of value-added services through different organizational business drivers, so delivering a positive return on investment.

The executives and CIOs involved in our study indicated that in order to be successful, the infrastructure had to be designed to accommodate the major issues facing each company in its marketplace, in essence creating a market-space dimension of the organization. The creation of a strong yet flexible infrastructure was a precursor to the third element of the development—that of business process integration. This was the point at which companies had to leverage the organizational learning and experience acquired through the internal development route into customer added value. Interestingly, a similar pattern of effective development has also been observed in parallel studies (Kalakatoa and Robinson, 2001; Ware et al., 1998).

Motorola provides an interesting case of effective internal development. They moved from skunk works experimental activities through process integration to highly market-focused value-adding e-business. They then institutionalised their organisational learning through the creation of a specialist group. Their journey started in 1994 when a senior manager with a marketing background was searching for a communications vehicle to underpin the Motorola On-line Channel Access concept to bring on board its supply chain partners. Emerging web-based technologies provided opportunities that eventually resulted in an e-business development plan as it became recognized across Motorola that the technologies had large-scale implications. By late 1994, 24 activities related to web-based technologies had been grouped into four chronological phases; creating awareness through a technology presence; then coordinating the brand and how the company was represented on the web; providing a service to customers

and channel partners whilst achieving cost and labour reductions; finally moving to revenue generation and one-to-one marketing.

An initial web presence was established in 1995, followed by nine months spent integrating back-end systems. Through 1996–99 the number of e-business initiatives and groups grew across ten business units. By 1999 an Architecture and Process group had been established consisting of a Director and eight technical developers responsible for back-end systems and web presentation. Their role was to deal with the business units, keep web content fresh and meet corporate guidelines. This centralized pool formed an organizational resource pool and also oversaw coordination and planning for all e-business development initiatives into 2001.

The ‘cheap-sourcing’ path

An organization that is not pressured in its market-space to be at the leading edge of internet presence would be advised to apply a ‘cheap-sourcing’ principle to its internet development. We found this to be often the case with organizations occupying niche market positions, for example, a New York-based jeweller, whose site did not initially facilitate a direct sales model and that did not change with the frequency of a retail site, could be managed at relatively low cost. The primary driver for such organizations was the promotion of the brand; a direct sales channel would dilute potentially the overall corporate marketing position rather than reinforce it. However, due to the need for a sophisticated branding image to be maintained, the company may wish to outsource the sites graphic design work, marketing and site development to specialists. It may not be in the long term plan of the organization to ever have a direct sales channel and therefore the need to internalize that learning is minimized. However, this may be to put a positive spin on what is in fact lagging practice. The jeweller mentioned above, for example, by 2001 had developed its site for selling its products over the web.

Another dimension to ‘cheap-sourcing’ since mid-2000 has been the reduced demand for e-business development services and the slacker market for IT expertise, together with widespread requirement across the developed economies to reduce IT budgets (Fisher, 2001; London, 2001). In our sample we found some organizations responding to the latter by cutting back on e-business initiatives, sometimes quite drastically. For example, UK retailer Safeway cancelled a number of

pilot initiatives for online shopping in 2001. Other organizations have taken advantage of changed economic conditions to cheap-source e-business developments, provided these were focused on low risk, internal productivity improvements, as we found, for example, at AirProducts and Office Depot.

The outsourcing path

Many organizations find themselves in the position of needing to rapidly develop a net presence, yet do not see any immediate economic advantage in extending its internal IT capability. In this situation, the most advantageous policy was to outsource the development. Here Internet use is developed by bringing in external consultants and service providers to inject the expertise otherwise gained through skunk works projects. Such external providers offer services in a variety of forms including Internet agencies, technical and application service providers, direct marketing agencies, and relationship marketers. However, ownership responsibility for the development should still belong with the contracting organization and issues such as maintaining infrastructure and providing business leadership still necessitate internal attention and action. Actual web development learning will be passed to the outsourcer, however, though internal learning on contract and supplier management skills still takes place. Some internal technology learning will also occur where the Net technologies and the existing infrastructure interface.

An organization in this situation was Lego. In March 1999 it was trying to establish its World Shop for its new children's game products. Competitively, speed was of the essence. As a result Lego outsourced its site and e-business development to IBM, though it hired a separate independent consultancy to do web-site design work. Compare also Jamjar, an on-line motoring information and car sale service, set up in May 2000 by UK-based insurer Direct Line. According to its IT Director:

It's a major development, and we went for external hosting, because it's a huge system, with huge volumes, running 24 hours a day seven days a week.

The Jamjar application was developed by Quidnunc and hosted by SiteHost a Computacenter e-business outsourcing service. In turn SiteHost uses the data centre facilities of web host Exodus where it has its own service operations centre.

The insourcing/partnering path

Should the rate of change in an industry be rapid and the resources of the organization become stretched too far then competitive edge can be lost. This is counter-productive from an organizational learning perspective and requires 'insourcing' to become the primary development practice. Thus in several corporations infrastructure building, balancing, and development, were performed by an internal group. Graphical Internet site design or other specialized tasks were externally sourced, and business process consultants were engaged to integrate the new channels created through the Internet with existing processes in the most effective way possible. A successful example of this approach is provided by American Express:

It goes to our basic philosophy which is we do not have to build everything. The question is how do we get our products and services integrated into internet interactive commerce. And you do it through people who are already working on it (Amex senior executive).

Mixed development paths

We found organizations adopting different sourcing options at different times, or for different purposes, in their moves to the Internet. As we saw above, insurer Direct Line took the outsourcing route for its Jamjar online business. Direct Line was set up in the late 1980s to sell motor insurance direct via the phone. The business expanded into other types of insurance during the 1990s. In the late 1990s it also set up Directline.com to sell insurance services via the net. However, this was developed in-house for less than £500,000. According to its IT director:

Directline.com is very much at the heart of our insurance business. It's totally and tightly integrated with our core systems. We couldn't have done it so quickly had it been outsourced.

Interestingly here, not only was the application seen as core business, but also, because internal expertise and business-specific knowledge were higher than that available on the market, the necessary speed could actually be achieved by in-house sourcing.

Another mixed approach was adopted by Tesco, the UK's leading food retailer. In 1998 Tesco piloted its on-line shopping business, Tesco Direct (subsequently Tesco.com), with 20,000 grocery products and six trial sites. By March 2000 Tesco.com was part of

multi-channel strategy, with some 100 stores involved and looking to gain more than half its on-line revenues from non-grocery items. In 1999 it made losses of £11.2 million on sales of £125 million but was looking to increase by threefold its half-a-million customers in one year, and to break even in 2002. It had spent £21 million on developing its internet offering in-house, and in mid-2000 invested another £35 million. However, in early 2000 Tesco also entered a less familiar, but faster moving market—on-line banking—in which it planned to leverage the power of its brand. The Tesco Personal Finance service was developed in three months through utilizing technology developed by its partner, the Royal Bank of Scotland (RBS), only needing to modify the software to allow customers to transfer money to and from their accounts at other banks. Both partners invested in a series of Compaq 3000 servers, running internally developed software, allowing Tesco customers to link in with the RBS IBM9672 mainframe, which holds account details. Here the need for speed, and the availability of a complementary partner in an unfamiliar business became the key determinants of the sourcing decision.

An example that brings together much of this discussion is the development route pictured in Fig. 2. The Figure shows how a corporation may well evolve through different parts of Fig. 1, depending on circumstances and different perceptions of the relative importance of cost, organizational learning and speed to the Net. The path taken between 1995 and 2001 by Alamo, the US-based car hire company can be described in these terms.

Alamo outsourced its early internet development. It ran into a number of problems. The web site was too stand-alone and not linked back into the technology infrastructure. It suffered a number of technical hitches and required continuous redevelopment. It also experienced some supplier commitment issues:

The one issue I had was ownership. An internal group, if I call them and say our web site is down, they feel it like I feel it; it is hitting profitability. A contractor does not have the same level of business commitment ... and if they are not enamoured with this particular arrangement they might not give you quite as good service. Whereas with an internal service you would have clearly defined roles and responsibilities ... (Alamo marketing executive).

By 1998 Alamo began internalising internet development, realising that web-based technologies were becoming a core part of the business. A series of web projects were launched and in 1999 a central group was developed to provide enterprise-wide service, support and control of business units' internet initiatives.

This pattern—of early outsourcing to gain the advantages of speed to the net, followed by internalisation due to the rising business importance of the Internet and the need for internal learning and capability—was frequently repeated in other organizations we studied, for example at Ryder Systems Inc. and P&O. The pattern also seemed to reflect those organizations' own increased learning about the advantages and disadvantages of different sourcing options. This learning also sharpened their ability to make more selective and

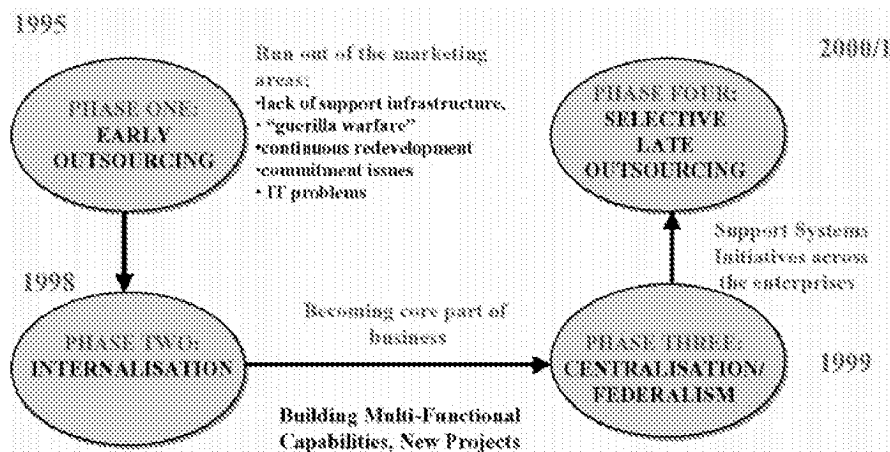


Fig. 2. Evolving through a mixed development path: Alamo 1995–2001.

precise sourcing decisions during phases two and three of Fig. 2, and also undertake selective late outsourcing of development and web operations in a fourth phase, on criteria we shall look at in the next section. Fig. 1 provides a summary of the issues that leading organizations tended to take into account when attempting to achieve trade-offs and mitigate risks in the choice and management of their sourcing options.

E-Sourcing: From Projects and Technology to Strategic Partnering

So far this paper has focused on sourcing technical development for e-business projects. But e-business sourcing is not solely about balancing learning and early use of new technology. It is also about making best use of the mix of internal and external suppliers throughout the organization's business processes. This involves understanding who has what core competences. In this section we examine the possibilities for more strategic forms of external sourcing as they emerged in many of the researched organizations—throughout the customer resource life-cycle, in supply chains and through value networks. Two examples from our study organizations are then used to illustrate leading sourcing practice when partnering strategically. Here 'strategic partnering' can be distinguished from the insourcing form of partnering described above which here is restricted to e-development activities (see also Fig. 1). Strategic partnering involves a much more long-term commitment to work together to underpin each other's strategies, as complementors in a competitive arena. Levels of dependence and trust need to be much higher, especially as each party will often be responsible for integrated, strategically critical activities of the other. We start by looking at two notions central to these forms of strategic partnering—those of core competence and co-opetition—and see how these concepts have been applied in our research sample in the e-business arena, notably around the customer resource life-cycle, supply chain and in forming value networks.

During the 1990s a very strong literature developed, focusing on core competence business strategies. Commentators such as Prahalad and Hamel (1990, 1994), and Quinn (1992) argued that an organization can only be effective at relatively few core activities, and should concentrate on developing these to world class. Anything else should be eliminated, minimised or out-

sourced. Here core competence refers to a distinctive, not easily replicable assembly of skills, techniques, ways of organizing, technologies and know-how that enable an organization to acquire, deploy and leverage positioning and resources, including relationships, in pursuit of business advantage (Feeny and Willcocks, 1998).

Debates about a specific firm's core competence are invariably bedevilled by two issues which both apply to e-business. The first is that it is frequently not easy to distinguish between a core and a non-core competence. For example, what is the scope of a core competence, and for how long can it remain a competitively differentiating factor? In our sample, Federal Express and UPS would recognise some of their core competence as lying in parcel logistics, but how do they differentiate themselves from each other, and what implications does the Internet have for redefining core and non-core in these firms? Below we will see Dell and Cisco effectively achieving distinctive definitions of core and non-core activities in the context of doing business over the Internet. Secondly, and relatedly, core competences, built over time as ways of dealing with problems and achieving stakeholder value, can create rigidities and resistances to value shifts in the competitive arena. This can be especially damaging in the fast-moving Internet-based business environment, where survival will often, according to many sources, belong to the fast and focused (Bornheim, 2001; Chen, 2001; Seybold, 2001; Willcocks and Plant, 2000). Again we will use illustrative examples to show such dangers, and how some organizations have avoided them.

In our research we found three notable areas where sample organizations adopted 'strategic partnering' sourcing principles in their moves to e-business. These were in externally sourcing at points around the customer resource life-cycle, in the supply chain, and through virtual integration and the creation of value networks.

Strategic partnering (1) in the customer resource life-cycle

In order to exploit the e-opportunity, many researchers have already borrowed from an older marketing literature, and stressed the criticality of gaining re-purchase decisions by managing the customer's total experience in such ways that the customer would regularly prefer the organization's products/services (Feeny, 2001; Seybold and Marshak, 1998; Schwarz, 1999; Mahadevan, 2000).

If the customer resource life-cycle of an on-line business is broken down into eight major activity areas, as suggested by Feeny (2001) it is clear that the technical means and businesses exist for each area to be adequately sourced by an external service provider.

1. *Attracting customers*—Many companies basically provide technologies and services that attract and deliver targeted audiences to an e-business. Services that we observed being used by sampled organizations, for example, Link Exchange and Befree, can provide fully developed customer affiliate programmes. We found DoubleClick offering targeted advertising.
2. *Informing customers*—We found organizations like OnDisplay.com and Cardonet.com acting as content mediators, serving up-to-date, relevant content to a web-site. Consider one of our researched organizations W.W. Grainger, in the maintenance, repair and operations business. It offers hard goods supplies to US businesses. Traditionally this has been done by printing 2.6 million catalogues and operating over 500 physical stores. In 1998 it partnered with OnDisplay which then proceeded to utilize the information from 2000 plus supplier databases to develop on-line interactive catalogues for Grainger's three web-sites. Grainger's on-line sales exceeded \$150 million in 2000, though it pulled back from some of its web-site exposure during 2001.
3. *Customizing (self) service*—We found companies like Firepond.com, Selectica.com and Calico.com build configuration software that is such a strong feature of the Dell site offering build-to-order computers, and the Cisco Systems and Cabletron Systems sites selling routers and networking gear. Calico provides Cabletron with a configuration workbench that prompts a customer as a salesperson would. It showed product features, analyses the customer's needs, budget, and time constraints, identifies compatible components, suggests options, and generated price quotes. It also generated an order that automatically passed to Cabletron's fulfilment systems that in turn updated stock, shipping and accounting databases.
4. *Transacting*—We found many companies, notably Ariba, Commerce One, Oracle, Moai Technologies offering market-making platforms. Ariba offered shared commerce services in B-to-B marketplaces. Its key customers in our sample included (as at 2001) Federal express, Cisco Systems, Charles Schwab and Chevron. CommerceOne offered web-based B-to-B procurement and platforms for creating vertical trading communities. Customers included British Telecom and Booz-Allen Hamilton. Moai Technologies provided B-to-B exchanges and auction platforms.
5. *Securing payment*—We found many organizations and customers having concerns over the security of payments over the web. These concerns have encouraged the development of companies to look after the payment and financing functions of on-line transactions. Thus we found eCredit.com providing real-time credit underwriting engines, while Paylinx offered systems that support credit and debit card transactions.
6. *Customer support*—many organizations new to e-business felt unable to provide the necessary level of information, problem resolution, advice and order tracking for their customers. As a result external service providers have developed offerings for, for example, call centre facilities, live on-line services and the checking of order status.
7. *E-fulfilment*—this represents a major potential area for new and fast growing e-businesses to outsource. By 2001, in B-to-B, we saw many businesses outsourcing supply chain management systems that facilitated order fulfilment and supply and demand forecasting. We found many examples of companies providing such services included Celarix, Manugistics and i2. In addition many e-fulfilment companies had developed for the business-to-consumer market. As one example, Entertainment UK in the Kingfisher Group developed for its own use an internal warehousing and e-fulfilment capability for items such as CDs and videos. During 2000 they also set up as an e-fulfilment business for the end-customers of other supplier companies such as radio channels making special offers to listeners.
8. *Adaptive customer profiling*—Rather than developing the necessary software and internal capability, some companies were hiring collaborative filtering and data mining services from providers such as Verbind.com, Datasage.com, and E-piphany.com. Verbind, for example, was providing sample corporation American Express with its LifeTime product.

This analysed up to one year's on-line transaction data, establishes each customer's buying pattern, and enables email and interactive messaging to customers and one-to-one marketing (Note 2).

At one level these would appear to be exciting and highly functional developments. However, outsourcing extensively throughout the customer resource life-cycle raised a number of issues for our researched organizations. Handing over control of activities creates exposure to risk. What level of exposure is judicious, and how can the risks be mitigated? Does increased dependence on suppliers mean that deeper relationships are required? At what stage might cooperators become competitors? In answering these questions one conclusion is clear as we shall see in the Cisco and Dell illustrative cases below—whatever the line of business, extensive fee-for-service outsourcing, and the treatment of every activity as a commodity to be outsourced is rarely appropriate.

A particularly profound problem occurs. How important is firm's ownership of the relationship with its end-customers? In practice, if this relationship is compromised through outsourcing, then so is a potential source of competitive advantage. Consider one company (A) we studied. Throughout 2000 it employed an e-fulfilment firm (B) to deliver goods but insisted that these be delivered to A's warehouse and not to the end-customer. At no time did B know who the end-customer was; it was only given enough information to deliver goods in the right quantity and at the right time to A. These goods were then relabelled by A and delivered to the end-customer. In this scenario, conditioned by previous experiences, A's behaviour was designed to protect its customer database and customer relationships. In these situations a company must be very careful to follow the examples of Cisco and Dell (described below) and delineate its core competencies (and how these may shift over time), but also put in suitable financial, information and managerial control processes, while developing strong co-dependent relationships with its complementor suppliers.

Strategic partnering (2) developments in the supply chain

Sourcing issues also arose from extensive use of third parties in the e-supply chain. By 2001 we found most firms investing over ten times more in this area than in their B2C initiatives. By that date 'bricks and mortar'

companies moving to the web still had plenty of scope for radical improvements, further enabled by newer applications and external suppliers entering the arena. Many amongst our study organizations were to be found into late 2001 still developing supply chain management, enterprise resource planning and customer relationship management systems, often with external assistance. All had built electronic links with their suppliers and with their retail outlets, and were at different points down the road of making these web-enabled. Rather fewer were doing this in a more sophisticated fashion, for example using auctions and exchanges in order to deal directly and more efficiently with suppliers and also with customers. This was especially the case during 2001.

As indicated above, some had also moved to handing over much of the e-fulfilment to external parties, while companies like Sun and Cisco Systems had handed over most of their manufacturing and delivery to other parties. In all this, few had developed the suite of highly integrated synchronised production scheduling, collaborative product design and development, logistics and demand planning systems that enabled value networks to develop such as those at Dell and Cisco Systems (see below). Given this variety, we will look at the implications of strategic partnering for just one e-application that gained popularity during 2000—that of web-enabled exchanges in the supply chain. We will use the specific example of one of the more developed in our sample—that of Covisint.

In November 1999, Ford and General Motors announced separate internet-based trading exchanges for their supply chains. Ford would partner with Oracle on Auto-Xchange, and General Motors with Commerce One on TradeXchange. By February 2000 a superior model had emerged. A single exchange would establish a global standard, and also be much more efficient. Ford, General Motors and DaimlerChrysler agreed to collaborate on a single automotive-parts exchange run through the Internet. The technology partners would be Commerce One and Oracle. The exchange was expected to deal with over US\$300 billion in transactions annually, and achieve significant cost reductions for the car companies. Ford claimed, for example, a \$10 million saving on a \$75 million purchase on its first full use of AutoXchange. Other car-makers, like Toyota, Renault and Honda also considered joining the exchange. At the same time Ford was updating its customer-oriented web-sites for new and

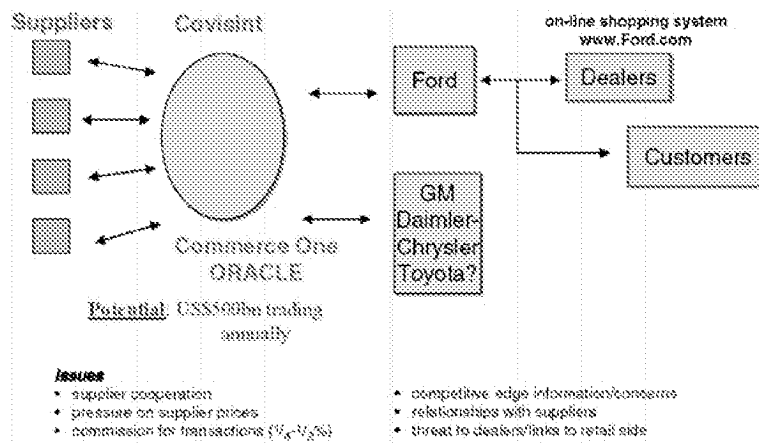


Fig. 3. Covisint: Remodelling supply and delivery (early 2001).

second-hand cars, announcing a joint venture with software developer Trilogy. By Autumn 2000 Covisint as the exchange became called had processed its first live transactions. These developments are shown in Fig. 3. During 2001 Covisint was actively engaged in managing live transactions for its constituent suppliers and car manufacturer customers.

During 2000 many such exchanges were announced across industries, though their development slowed markedly during 2001. However, although these developments sounded attractive, they do hide a number of complexities. Focusing on just the Ford/GM/DC example, the substantial cost savings for the car manufacturers also implied downward pressure on supplier prices and some switch of bargaining power from suppliers to the manufacturers. The auto exchange would also charge up to 0.5 per cent commission on transactions. This amount would go to the manufacturers and technology developers running the exchange. So, how neutral would this joint venture be? Would other car manufacturers using the exchange feel excluded from influence and access to certain benefits? Clearly, the exchange represents considerable migration of value and power in the supply chain. Not surprisingly, therefore, by April 2000 Volkswagen had announced its own marketplace for procurement, forming a strategic partnership with IBM, i2 Technologies and Ariba. In the face of such proliferation of markets, six of the largest automotive parts suppliers themselves announced that they would work together on joint technology solutions because of the problem of 'repetitive costs'.

The trading exchange also raised competitive edge concerns amongst some potential participants. As early as March 2000, Toyota suggested that it would restrict its participation to trading only in basic commodity items and office supplies. The company had several concerns about the exchange, centring on quality assurance and security on an open network. For Taadaki Jagawa, vice-president of procurement: *'the other companies are our rivals and we are competing on parts. We do not share information about our components,'* including information about the price of core parts. Moreover: *'our parts are not purchased through a bidding process. We buy them by building a relationship with suppliers over time.'* Essentially Toyota saw its suppliers more as partners, and believed the close relationships with them gave a competitive edge in quality assurance but also in lead time on new car development. The spot pricing encouraged by a more transparent market could erode such relationships.

Further developments in e-business on the customer side could also threaten the role of dealers in the distribution chain—a notoriously sensitive area, analogous with web-enabled disintermediation in the travel agency and insurance broking industries. Meanwhile in the supply chain there may well be a number of more technical problems. One is non-repudiation—where an on-line company must be able to guarantee to a supplier that it can legally prove a purchaser's identity and activities in a court of law. A second is establishing standards for information exchange. XML on its own is as broad as data itself. Moreover technology suppliers

are still much more enthusiastic about it than the majority of users, who typically will have different starting points on data protocols. All the issues considered in this section make clear that external 'strategic partnering' in remodelled supply and distribution chains can be a lot more complicated than they first seem. Once again we will see in the Dell and Cisco cases below the foundations of effective e-sourcing practice. We also need to acknowledge that the principles gleaned from more traditional forms of IT outsourcing (see Note 3), and also learned from implementing e-business projects (as described above) still directly apply.

Strategic partnering (3) towards virtual integration

As organizations move to e-business we have also seen new forms of organizing, such as the 'M' form and syndication (Moore, 1998; Werbach, 2000), but also a resurgence of more familiar ideas. Thus concepts such as 'co-opetition' and the virtual organization have considerable salience in the e-business world, and imply considerable use of external allies and service providers (Nalebuff and Brandenburger, 1996; Child and Faulkner, 1998). Co-opetition is about collaborating to compete, by allying with firms with complementary capabilities to mutual competitive advantage. In a schema that translates immediately into the e-world, Nalebuff and Brandenburger posit a value network consisting of the company, its customers, suppliers, competitors and complementors. A player is your complementor if customers value your product/service more when they also have the other player's offering than when they have your product/service alone. Organizations have multiple roles in a value network. For example, in our sample, on any given day AT&T might find, for different parts of their businesses, Motorola might be a supplier, customer, competitor or complementor.

A related concept is that of the virtual organization. As Child and Faulkner (1998) point out, few companies are excellent at all functions. Therefore greater value can be created if each concentrates on only the functions it does best, and relies on cooperating partners to carry out the other functions. In the value network, this requires cooperative attitudes, clear understanding of central objectives, electronic (increasingly web-enabled) coordination and communication, and flexible modules, cultures and workforces.

In our research, Cisco Systems and Dell provided clear examples of virtual integration. Cisco's strategy was found to be threefold: do what it's best at, make acquisitions (over 55 since 1993), and secure alliances. By mid-2000 it had outsourced most of its production to 37 factories. Suppliers made all components, and carried out 55 percent of sub-assembly work and 55 percent of final assembly. All factories were linked via the Net, and an intranet was used for most internal work at Cisco. The internal pages received 28 million hits a month. Use of the web was saving Cisco an estimated US\$500–800 million a year during 2000. 84 percent of sales were through the web-site, which allowed customized configuring and checking by customers. 85 percent of customer queries were handled on-line.

All this enabled a high degree of virtuality. According to one respondent: 'we can go from quote to cash without ever touching a physical asset or piece of paper. You've heard of JIT manufacturing, well this is not-at-all manufacturing'. However, Cisco has been careful to control and dominate the value network. Thus it has maintained three factories itself to understand and give flexibility to its manufacturing base. Cisco designs production methods and uses the Internet to monitor operations closely. It also controls research and development. So for new production methods, for example: 'the source code is developed here and maintained here. So the innovation is all at Cisco.'

Dell has explicitly described its strategy as that of virtual integration. In 2000 it made more than US\$40 million a day (over 50% of total sales) via the Internet. Its success is invariably put down to its customer focus. However, an underlying vital component, especially into the difficult market place of 2001, has been sourcing strategy and management. According to the CEO: 'I don't think we could have created a \$12 billion business in 13 years if we had tried to be vertically integrated.' With fewer physical assets and people it has had fewer things to manage and fewer barriers to change. Through IT-enabled coordination and control of its value network of suppliers and partners, Dell can operate with less than a 20,000 rather than an 80,000 workforce. In the supply arena it has focused on making long-term deals and commitments with as few leading suppliers as possible. Datalinks measure and feed back supplier performance in real-time. Close ties with suppliers ('their engineers are part of our design and implementation teams') mean that Dell buys in

innovation from its suppliers. Information technologies allow speed and information-sharing and much more intense forms of collaboration. It also means that suppliers can be notified precisely of Dell's daily product requirements. This has also allowed Dell to focus on inventory velocity, and keeping inventory levels very low.

Dell has also sought strong partnering relationships with key customers. Seen as complementors, customers are often involved in research and development, where Dell's focus is on relevant, easy-to-use technology, improvements in the customer buying process, keeping costs down, and superior quality in manufacturing. Dell also offers service centres in large organizations to be close to the customer. Thus Boeing has 100,000 Dell PCs and 30 dedicated Dell staff on the premises.

For present purposes, the criteria these companies are using to make sourcing decisions are particularly pertinent, showing ways of avoiding the strategic partnering dangers flagged above. Clearly Cisco has adopted practices that leverage complementors and suppliers whilst enabling Cisco to dominate the value network it has created. On our analysis, the Dell criteria for what are core competencies, and what can be safely outsourced, but under a strong regime of financial, managerial and information control, would seem to be five-fold:

1. Dell focuses its attention on all activities that create value for the customer. This includes R & D involving 1500 people and a budget of \$250 million, that focuses on customer-facing activity and the identification of 'relevant' technology. It tends to outsource as much as possible all other activities that need to get done.
2. Dell carefully defines its core capability as a solutions provider and technology navigator. It uses partners/suppliers as much as possible to deal with such matters as products, components, technology development, assembly.
3. A key core task is coordination as against 'doing' tasks such as manufacturing and delivery
4. Dell takes responsibility for seeking and improving all arrangements that give it speed and focus in the marketplace and in its organizational arrangements
5. A key core capability is control of the value network through financial and informational means to ensure requisite speed, cost and quality. What does

Dell control? Basically the company appoints and monitors reliable, responsive, leading edge suppliers of technology and quality.

This last point is worth developing because informational control emerges as a cardinal external sourcing risk mitigator in our study. Dell treats information management and orchestration as a core capability. This is an outcome of two strategic moves on its part. The first is to convert as much of the physical assets (atoms') it manages into digital form ('bytes'). The second move is to outsource as much as possible of the remaining physical tasks and assets, while rendering management of the digital world a core set of tasks.

In Dell's and Cisco's external sourcing practices we found strong examples of what other researched organizations were discovering as the more effective ways of managing suppliers and complementors. In particular, Dell revealed itself as having massive clarity about what was core, and what was not. This enabled it to place 'non-core' activities as candidates for external sourcing, and make decisions on the best type of external sourcing. A further lesson from Dell and Cisco, especially where strategic partnering was being undertaken, was the critical importance of maintaining financial, managerial and information control in the relationship with any external supplier/partner thus offsetting many of the risks identified above. In the final section, to assist e-sourcing decisions, we bring together such learning from our study into two linked, summary matrices.

Conclusion: Management Implications for E-Sourcing

Our research has made clear that, whether at the IT, project or strategic partnering level, fortunately, we can apply to e-business sourcing many of the principles learned in other contexts in the 1980s and 1990s (Note 3). Cisco and Dell are not so far removed from what has been called the original virtual organization, clothing manufacturer/retailer Benetton (Camuffo, Romano, and Vinelli, 2001). Moreover many of the practices observed in IT sourcing over the last decade can apply directly to the e-world (Garner, 1998; Lacity and Hirschheim, 1995; Kern and Willcocks, 2002). The purpose here is to build on this knowledge and focus on bringing the effective e-sourcing principles we have

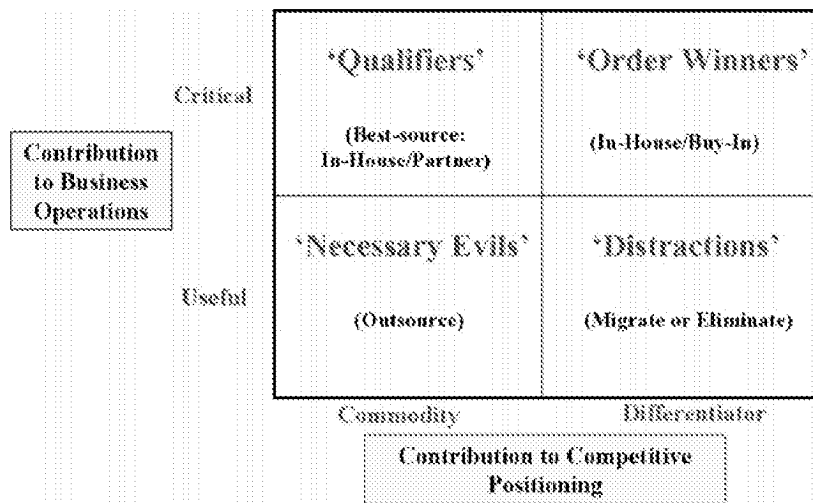


Fig. 4. Strategic e-sourcing (A) by business activity.

observed in action in our study organizations together. As such the two matrices we now develop incorporate the learning from studying the sourcing of e-business development (including that identified in Fig. 1), and the varieties of strategic partnering identified above.

Our research suggests that e-business sourcing must start with the business imperative. In Fig. 4 we identify two dimensions of business activities. The first is in terms of its contribution to competitive positioning. In IT, mainframes and payroll applications are frequently perceived as commodities, while British Airways' yield management system gives the company a competitive edge in ticket pricing and is regarded as a differentiator.

The second is in terms of the underpinning it provides to business operations. As a broad example one web-site might be critical—as is the case for Amazon (no website, no business)—or it could be merely useful—for example the New York jeweller cited earlier. These two dimensions create four quadrants.

Let us use the Dell example to illustrate the thinking here. 'Order Winners' are those business activities that critically and advantageously differentiate a firm from its competitors. The six Dell items listed first in the previous section fall here. The strong message here is to carry out these core activities in-house, buying in resources to work under internal control where expertise

is lacking and a build-up of internal learning is required. 'Qualifiers' are business activities that must be carried out as a necessary minimum entry requirement to compete in a specific sector. Historically, for airlines, aircraft maintenance systems are critical, but generally do not differentiate the airlines from each other—though of course the basis of competition may change over time. Thus in 1996 the CEO of British Airways argued that the brand, routes and the yield management system were 'core'—in principle all else could be outsourced. Often critical differentiators can become commodities and move to this quadrant. Thus, were Dell's excellent customer service ever to become an industry standard, it would be redefined as a 'Qualifier'. As at 2001, assembly, manufacturing and delivery are being defined by Dell as 'Qualifiers'. These should be best sourced and can be done by third parties, where they meet the right cost and competence criteria (see below).

'Necessary Evils' (a respondent's phrase, not ours) are tasks that have to be done but are not core activity and gain no strategic purchase from their fulfilment. Dell has tended to cut down on administration, inventory and payroll tasks, for example, and would seek to outsource as much of these sorts of activities as possible. 'Distractions' are failed or failing attempts to differentiate the organization from its competitors. The goal here must be to eliminate the activity or migrate it to another quadrant. Thus in 1989 Dell opened retail outlets, but soon discovered this

development was not going to be successful, and fell back on its direct business model. It also during the early 1990s suffered from ‘functionality creep’ in its notebook designs, a practice ended when it was realised that this attempt to differentiate meant little to customers. A more profound mistake is not to notice until too late the value shifts in a specific competitive arena, for example IBM against Microsoft and Intel in the late 1980s/early 1990s PC market. Up to 2001, Dell had made few mistakes in this area. In fact we found its low cost web-based distribution strategy giving it a critical competitive edge on pricing during 2001. Perhaps this resulted from its CEO’s explicit recognition that ‘looking for value shifts is probably the most important dimension of leadership’ (Note 4).

It is not enough, however, to identify a potential use for service providers or business allies. What is available on the market also requires detailed analysis. If the market is not cheap, capable or mature enough, then the organization will need to seek a largely in-house solution. Therefore the business activity analysis of Fig. 4 needs to be supplemented by a second matrix to fully capture the major elements for consideration when utilizing the market.

In Fig. 5 we plot the cost-efficiencies and the capabilities the market can offer against carrying out tasks internally. Where the market can carry out a task cheaper and better, then outsourcing is the obvious decision but only for ‘Qualifiers’ and ‘Necessary

Evils’. An example is Federal Express providing customer delivery for Dell. Where the market offers an inferior cost and capability then in-house sourcing will be the better alternative (assuming that ‘Distractions’ are best not sourced at all). Where the market offers a better cost deal, then this should be taken, but only for non-key activities (‘Necessary Evils’). Where the market offers superior capability but at a premium price above what the in-house cost might be, then there may still be good reasons for insourcing or strategic partnering with the third party, not least to leverage and learn from their expertise, and apply it to ‘Qualifying’ and ‘Order Winning’ tasks.

Thus Figs. 4 and 5 help to summarize the main criteria that can be used for making e-sourcing, and, in fact, many other business sourcing decisions. The matrices illustrate the decision criteria we uncovered that mitigate the often significant risks that arise when attempting to leverage external parties for organizational advantage. But, as this paper illustrates, making the right sourcing decisions does not guarantee their successful implementation. As in the cases of Dell and Cisco, internal capabilities must be developed to manage the risks, relationships and performance issues inherent in the extensive use of external service providers and business allies. This too endorses the relevance of findings elsewhere on outsourcing implementation practices in the more traditional IT world (Earl, 1996; Feeny and Willcocks, 1998; Garner, 1998; Klepper and Jones, 1998).

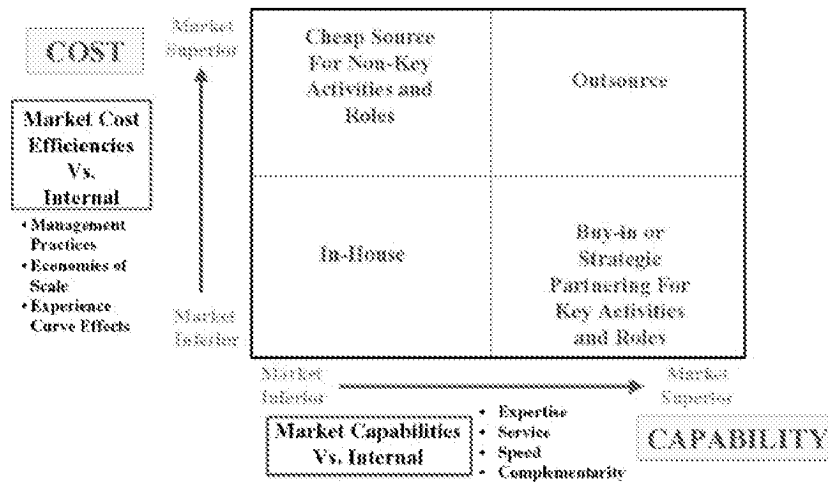


Fig. 5. Strategic e-sourcing (B) by market comparison.

Appendix: Details of the 78 Corporations Studied Throughout 1999–2001

Case study organizations performance assessment			
Company sector	Country	Performance	Development path
1. Comp. hard.	USA	Leader	Internal
2. Banks-M.C.	USA	Leader	Internal
3. Transpnt. services	USA	Leader	Internal
4. Financial div	USA	Leader	Insource then selective partnering
5. Comm. equip	USA	Leader	Internal
6. Utilities	USA	Mid level	Internal
7. Comps. hard	USA	Leader	Selective partnering
8. Chem. -spec	USA	Laggard	Internal
9. Nonmetallic minerals	USA	Laggard	Internal
10. Biotec	USA	Leader	Internal
11. Manf. specialized	USA	Mid level	Internal then selective partnering
12. Entertainment	Japan	Leader	Internal
13. Online retail	USA	Mid level	Internal then selective partnering
14. Automotive	UK	Laggard	Internal
15. Automotive	Germany	Mid level	Internal then selective partnering
16. Svcs. comm	USA	Mid level	Outsourced then internalized then selective outsourcing
17. Logistics	USA	Laggard	Internal
18. Internet services	USA	Laggard	Internal
19. Travel	USA	Mid level	Selective partnering
20. Healthcare services	USA	Mid level	Internal
21. Financial	USA	Laggard	Internal
22. Insurance carrier	Swiss	Mid level	Internal
23. Finance	USA	Leader	Internal then selective partnering
24. Energy	France	Leader	Internal
25. Defense	USA	Leader	Internal
26. Finance	USA	Leader	Internal then selective partnering
27. Finance	USA	Leader	Selective partnering
28. Automotive	USA	Leader	Selective partnering
29. Internet service provider	USA	Leader	Internal
30. Retailing	USA	Mid level	Selective partnering
31. Retailing	Australia	Laggard	Internal
32. Automotive	USA	Mid level	Selective partnering
33. Energy	USA	Mid level	Selective partnering
34. Transportation	USA	Leader	Selective partnering
35. Insurance	UK	Mid level	Internal
36. Banking and financial services	Finland	Leader	Internal
37. Basic materials	USA	Mid level	Internal
38. Retailing	UK	Laggard	Internal
39. Entertainment	Denmark	Mid level	Outsourced/external
40. Automotive	UK	Mid level	Outsourced/external
41. Retailing	UK	Leader	Mixed
42. Transportation	UK	Laggard	1st Outsourced then internalized
43. Telecommunications	UK	Mid level	Selective partnering
44. Consulting	USA	Mid level	Selective partnering
45. Telecommunications	USA	Leader	Selective partnering
46. Hi tech supply/services	France	Mid level	Internal then selective partnering
47. Aerospace	USA	Laggard	Internal
48. Office supplies	USA	Leader	Internal

(Continued on next page).

Case study organizations performance assessment

Company sector	Country	Performance	Development path
49. Medical manufacturing	USA	Leader	Internal then selective partnering
50. Communications equipment	USA	Leader	Internal
51. Utilities	USA	Leader	Internal
52. Rental & lesing	USA	Laggard	First outsourced then internalized
53. Printing & publishing	USA	Leader	Internal
54. Recreational activities	USA	Mid level	Internal then selective partnering
55. Construction services	USA	Laggard	Internal
56. Insurance	USA	Laggard	Internal
57. Misc. capital goods supplies	USA	Mid level	Strategic partnering
58. Banking and financial services	UK	Mid level	Internal
59. Computer hardware	USA	Leader	Selective partnering
60. Computer hardware	USA	Mid level	Internal
61. Online travel industry	USA	Mid level	Strategic partnering
62. Electrical component manufacturer	UK	Mid level	Internal then selective outsourcing
63. Financial services	Australia	Mid level	Internal with limited selective outsourcing
64. Power utility	Australia	Mid level	Selective outsourcing
65. Retailing	UK	Laggard	Internal
66. Retailing	UK	Mid level	Selective outsourcing
67. Online hi-tech service provider	USA	Mid level	Strategic partnering
68. Entertainment supplies	UK	Mid level	Internal then selective outsourcing
69. Engineering	Germany	Mid level	Internal plus technology partnering
70. Airline	USA	Mid level	Selective outsourcing
71. Insurance	USA	Laggard	Internal
72. Banking and financial services	UK	Laggard	Selective outsourcing
73. Online hi-tech security and services	UK	Leader	Internal
74. Water utility	UK	Laggard	Selective outsourcing
75. Apparel	UK	Laggard	Internal then selective outsourcing
76. Insurance	USA	Laggard	Total outsourcing
77. High street retailer	Australia	Mid level	Internal then selective outsourcing
78. High street conglomerate	UK	Laggard	Selective outsourcing

Note: The companies have been anonymised throughout at their request. The judgements on Performance and Development Path are those of the authors, arrived at by applying the criteria described in the paper. The assessments have been updated to the end of 2001.

Notes

1. A more general study reinforcing this is by Kanter R. (2001). The ten deadly mistakes of Wanna-Dots. *Harvard Business Review* 2001;79(1):91–105; See also Yoffe D., Cusumano M. Building a company on internet time: Lessons from netscape. *California Management Review* 1999;41(3):8–28.
2. For further examples see Davis J. ed. How IT works. *Business* 2.0, 2000: 112–140. The customer resource life cycle concept has a long history, in fact, and receives more detailed attention in Ives B., Learmonth G. The information systems as a competitive weapon. *Communications Of The ACM* 1984;27(12):15–26. See also Vandermerwe S. *Customer Capitalism*. London: Nicholas Brierley Publishing, 1999.
3. Two good overviews for these principles are Klepper and Jones (1998) Op. Cit., and Lacity and Willcocks (2001) Op. Cit. as cited in the References.
4. Quoted in Magretta, J. The power of virtual integration: An interview with Dell computer's Michael Dell. *Harvard Business Review* 1998; 73–84.

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Leslie Willcocks has an international reputation for his work on e-business, information management, IT evaluation and information systems outsourcing. He is professor of Information Management and e-business at Warwick Business School, UK. He is also Associate Fellow at Tempteton College, Oxford, Visiting Professor In Information Systems at Erasmus University,

Rotterdam, Professorial Associate at the University of Melbourne, and Distinguished Visitor at the Australian Graduate School of Management. He holds a doctorate in information systems from the university of Cambridge, and has been for the last 12 years Editor-in-Chief of the Journal of Information Technology.

He worked for twelve years in accounting and management consultancy, for Touche Ross and several smaller firms, before heading a Research Centre at City University Business School, London. He moved to Oxford University in 1992 where he was for nine years Fellow and University Reader at Templeton College. He is co-author of 23 books, and has published over 130 papers in journals such as Harvard Business Review, Sloan Management Review, California Management Review, MIS Quarterly, Journal of Management Studies, Communications of The ACM, and Journal of Strategic Information Systems.

In 1998 he served as expert witness on information management issues to the US Congressional Committee on Restructuring the Internal Revenue Service, and provided evidence to the UK Government's report on public sector IT projects published in March 2000. In May 2001 he was expert witness to the Senate Inquiry into the Australian central government's IT outsourc-

ing initiative. Dr. Willcocks received the Price WaterhouseCoopers/Michael Corbett Associates World Outsourcing Achievement Award for his contribution to this field in February 2001.

Robert Plant is an Associate professor at the School of Business Administration, University of Miami, Coral Gables, Florida. He obtained his Ph.D. in Computer Science at the University of Liverpool, England, previously having previously studied computation at Wadham Collage, Oxford University. Dr. Plant is a Microsoft Certified Systems Engineer (MCSE), a Chartered Engineer and European Engineer. He holds visiting teaching and research positins at Templeton College, Oxford University, England; Universidad Gabriela Mistral, Santiago, Chile; and Victoria University of Wellington, New Zealand. Dr. Plant's research interests are centered on the role of information systems in strategic management. He is the author of "eCommerce: Formulation of Strategy" published by The Financial Times of Prentice Hall. He has published extensively in such leading journals as Sloan Management Review, Communications of the ACM, JMIS and Information & Management.