

Accounting for e-commerce: abstractions, virtualism and the cultural circuit of capital

Andrew Leyshon, Shaun French, Nigel Thrift,
Louise Crewe and Peter Webb

Abstract

This paper considers the phenomenon of e-commerce as an achievement of serial acts of representation and re-representation. Drawing upon the concepts of virtualism and the cultural circuit of capital, we attempt to demonstrate the material consequences of economic abstractions. The paper looks at the constitutive role of virtualism within the development of a domain called e-commerce. Mobilized by a heterodox group of actors, including academics, consultants, journalists and practitioners, abstractions demonstrated considerable agency in the construction of e-commerce, and were used in an attempt to demonstrate that a new, and potentially hyper-profitable, form of capitalism was being born. This paper undertakes a critical evaluation of these processes and draws attention to the neglected role of the cultural circuit of capital and a range of practical knowledges that are continually being revised and which we argue are equally constitutive of e-commerce. While it is easy to dismiss the promises of e-commerce as so much hyperbole, particularly in the wake of the dot.com crash, we argue that the success of e-commerce is signaled by the fact that it *has* lost much of its rhetorical power and has faded into the business background. E-commerce now constitutes an increasingly ambient set of technologies and practices.

Keywords: virtualism; abstractions; e-commerce; business knowledge; Internet.

Andrew Leyshon, Shaun French and Louise Crewe, School of Geography, University of Nottingham, Nottingham, NG2 7GW, UK. E-mail: Andrew.Leyshon@nottingham.ac.uk; Shaun.French@nottingham.ac.uk; Louise.Crewe@nottingham.ac.uk. Nigel Thrift, Pro-Vice Chancellor, Research University of Oxford, 9 Parks Road, Oxford OX1 3PD, UK. E-mail: Nigel.Thrift@admin.oxford.ac.uk. Peter Webb, Department of Sociology, University of Birmingham, 32 Pritchatts Road, Birmingham, B15 2TT, UK. E-mail: P.M.Webb@bham.ac.uk.

A time is marked not so much by ideas that are argued about as by ideas that are taken for granted. The character of an era hangs upon what needs no defense. Power runs with ideas that only the crazy would draw into doubt. The 'taken for granted' is the test of sanity; 'what everyone knows' is the line between us and them.

(Lessig 2001: 5)

Introduction

This paper is about the ways in which knowledge is both produced and circulated within modern economies. Our argument is that this process increasingly takes place in structured ways that depend upon the presence and effectivity of particular theories of the world. In other words, these theories do not just represent the world but are partly constitutive of it. This kind of depiction of economic life is often nowadays called 'virtualism', a term that refers to the way 'the economy is increasingly forced to change itself in order to match the descriptions of abstracted models that are produced by academic economists' (Miller 2000: 201). However, Miller's notion of the world as driven by academic economists is too strong, and needs tempering by recognition of another group of theory-builders, including consultants, journalists and other economic commentators of various kinds.

In this paper, we have two main objectives. The first is to argue that virtualism has played a key role in the construction of a whole series of practices that have come to be known as e-commerce. However, as we shall make clear in this paper, the current understanding of virtualism can only ever tell half of the story. At present, virtualism assumes causality flows from abstraction to practical action, with theories and concepts acting as guidelines and templates for social action in a range of economic contexts. The second objective of the paper, therefore, is to argue that in many cases the flow of information and influence is the other way round; that is, that practices play a key role in the construction of a wide range of abstractions. Through an analysis of the development of e-commerce this paper offers a sympathetic critique of the concept of virtualism as currently conceived. It seeks to extend the range of actors understood to be involved in the construction of economic abstractions beyond academic theorists, to encompass other 'business intellectuals' who are more actively engaged in the commercial world, such as consultants and business journalists, for example. In addition, we wish to illustrate that virtualism involves the mobilization of many different kinds of abstractions that operate on different scales and registers. Finally, we also aim to explore some of the limitations of even the extended definition of virtualism in accounting for the rapid rise of Internet-based commerce.

Accordingly, the paper is organized as follows. The first part of the paper reviews the notion of virtualism and extends it to the so-called cultural circuit of capital (Thrift 2002). Drawing on research undertaken by the authors the

second part of the paper looks at the development of a domain called e-commerce and, in particular, the role played by two of the most high profile abstractions – the term ‘e-commerce’ itself and the influential idea of first mover advantage – in providing a rationale and justification for Internet-based commerce. The third part of the paper then considers the need to take into account institutions and actors other than academic economists and abstractions other than formal economic theories in thinking about the role of virtualism in constituting e-commerce. Finally, the concluding part of the paper considers some of the limitations of the extended definition of virtualism proposed, as well as considering how the definition and practice of e-commerce has changed as a result of corrections in the social and economic valuation of e-commerce and the ‘new economy’.

Virtualism

The concept of virtualism, developed by the likes of James Carrier and Danny Miller (Carrier and Miller 1998), argues that abstract theory is having a greater purchase over the material reality of economic and social life. The growing hold of abstracted modes of thought is due, at least in part, to the growing power of the academic discipline of economics, which has produced a steady flow of theoretically accomplished graduates who have colonized important social and economic institutions throughout the world economy and have successfully influenced modes of thinking and doing.

What had been a rather arcane academic discipline, made visible by the presence of occasional representatives who, like Keynes, engaged in public debate, has become more prestigious and pervasive. Not only is there now a Nobel prize awarded in economics (the only social science so treated); economists who have won that prize, together with their less exalted fellows, write columns in popular periodicals (for example Becker) and lecture the public on the fallacies of government policy (for example Krugman). Similarly, economists have increasingly visible and powerful positions in a range of organizations that deal with money. The World Bank is a striking example, an institution that appears to be dominated in important ways not by bankers but by economists – a situation analogous to having an aircraft design company dominated not by aerodynamic engineers but by physicists.

(Carrier 1998: 7)

The growing influence of economic theory within the world more generally has important practical effects, as the circulation of economic ideas within different forums increasingly shapes economic practice. The reason for this, or so Carrier argues, is that ‘people are driven by ideas and idealism, [and] the desire to make the world conform to the image’ (1998: 5). The particular power of economic abstraction is a product of its presence within influential institutions, such as the World Bank and the International Monetary Fund,

which have the ways and means to shape the real in the image of the ideal (see Stiglitz 2002). In so doing, idealized apprehensions of the world produced through theory are held up as desirable states of being to which social and economic life should conform. It is the attempt to make the unfolding of social and economic life conform to such ideals that constitutes virtualism.

There are a number of examples of the power of virtualism in the form described by Miller, where academic theories are used to directly guide economic action. One example is the allocation of bandwidth spectrum for 'third generation' (3G) mobile telephony within the UK. To prepare for the auction, the government invited tenders to suggest suitable systems for the allocation of bandwidth. It awarded the contract to the consultancy arm of the Centre for Economic Learning and Social Evolution, based at University College London. The sale was to be based upon game theory, and in particular upon work on competition and auctions, developed originally by the likes of William Vickery, and resulted in bandwidth being allocated to those firms making the highest bids (Bentley 2000; Sabbagh 2000).¹ As the spectrum available was limited, and the anticipated gains from the sale of 3G services were projected to be high, competition for bandwidth was fierce. Firms bid not just upon the perceived value of bandwidth, but also on the cost of surrendering parts of the spectrum to their competitors. When the auction closed in 2000 it had generated £22.5 billion pounds for the public coffers (for a full account of the auction, see Binmore and Klemperer 2002).

From one perspective, this particular instance of virtualism may be seen as progressive and beneficial. The government had anticipated an income of just £3 billion from the sale, so it enjoyed a significant cash windfall that was of potential benefit to the UK economy.² However, from a different perspective, and particularly with the benefit of hindsight, the outcome of the auction may be seen as more regressive. The allocation of bandwidth via a competitive auction meant that firms significantly overbid for their share of the spectrum, spending as much as £200 for every adult in the UK in some cases (Keegan 2000). It is estimated that it will take as much as twenty years for investments in 3G to be recovered (Rushe and Oldfield 2000). Indeed, so burdened by debt were some telecommunication companies – the replication of the British auction in other European economies mean that telecommunication companies are estimated to have invested as much as \$250 billion securing 3G licences across the continent – that doubts have been expressed about their long-term solvency (*The Economist* 2001).

While not wishing to deny the significant role played by formal economic models, it is our view that the idea of virtualism as currently conceived can only stretch so far. The above examples illustrate that the concept is most effective when attempting to explain the roll-out of policies of government and international regulatory organizations (such as the World Bank and the IMF). It is less effective in comprehending economic processes that are less dependent upon the leverage of powerful state and quasi-state institutions to bring about change. To make a convincing case for the power of virtualism it is

necessary to foray into other institutions that generate economic accounts, such as the media, management consultancies, management gurus and prestigious business schools. Each of these institutions is in the business of continually churning economic ideas for profit, and they make up what Thrift (1999) has described as the cultural circuit of capital, a self-organizing network for the production and distribution of management knowledge which 'has a constant and voracious need for new knowledges' (Thrift 1999: 42). Unlike the genesis of formal economic theories, accounts in this domain tend to originate from a large number of sources that are not structured and disciplined by the academic field. So, for example, management consultancies may draw upon economic theory, they may take up management theories of various kinds or they may recycle and codify practical accounts, transforming them into relatively immutable mobiles (Latour 1987).

For example, in the 1980s and 1990s, there was a vogue for 're-engineering' the corporation based around a particular set of ideas and concepts that were claimed to transform organizations into more flexible and responsive entities. The aims of business process re-engineering (BPR), 'arguably the most ambitious management theory of our time' (Micklethwait and Wooldridge 1997: 29), were to create a more effective and purposeful company, one that swept away the inefficiencies and factionalisms that might have accumulated over many years and which might be entirely inappropriate to the current business environment. BPR is a system which, when introduced to an organization,

reengineers the structure and functions of the organization around the 'processes' that link production to final consumption. The advocates of BPR . . . believe that it is the only way of breaking down the inefficient and bureaucratic departmental and specialist divisions that are the preoccupation and playground of internal vested interests.

(Knights and McCabe 1998a: 164)

BPR rose to prominence through a process shared by many other business fads that thrived during the 1980s and 1990s. The formula, according to O'Shea and Madigan, was 'Get an article in the *Harvard Business Review*, pump it into a book, pray for a best seller, [and] market the idea for all it is worth through a consultancy company' (1998: 189). BPR appeared 'first in a *Harvard Business Review* article by Michael Hammer in 1990, the idea soon became Hammer and James Champy's *Reengineering the Corporation*, a best seller that sparked reengineering projects all across the Fortune 500 companies' (ibid.: 190). However, these numerous BPR programmes produced rather mixed outcomes: while BPR helped some companies refocus their activities and increase profitability, in others it became little more than an excuse for 'downsizing', a process that has been associated with a declining levels of innovation (Micklethwait and Wooldridge 1997). One of the problems with BPR is that it is essentially a decontextualized programme of action that sets as its goals a normative, idealized organizational form within which organizational politics

disappear into the ether. As case studies of companies that have experienced BPR have shown, such an objective is little more than an evangelical fantasy (Knights and McCabe 1998a, 1998b).

In the next part of the paper, we examine the relationship between virtualism and the emergence of a set of variegated economic ideas and protocols which gradually stabilized as a domain known as e-commerce. In so doing we draw on research conducted by the authors as part of a larger study on the development of Internet-based commerce.³

Virtualism and e-commerce

E-commerce did not come fully formed into the world. It emerged from conscious decisions about the use of various logistical technologies. These technologies in turn were shaped by such decisions and the kinds of conventions that formed around them as agreement upon effective uses developed. Decisions were often made from a basis of practical experimentation, which took place within both commercial and non-commercial environments. Then, as we will show, these conventions have begun to sink into the business background, with the result that the domain of e-commerce is increasingly taking on such a routine form that it no longer needs a special description as being a particular kind of practice. Thus, it has almost become embarrassing to refer to a phenomenon such as e-commerce because its use and applicability is so obvious that it no longer warrants description. For example, during many of our interviews with practitioners, and particularly those conducted within the United States, we were conscious of the fact that even wanting to discuss 'e-commerce' marked us as people who were somewhat out of step with current developments in the field. While attending a 2002 business convention on on-line music, we attempted to explain our research project to a leading industry figure in the hope that an interview could be secured later in the day, only to be told by our would-be respondent that that the project was 'so 1997'. Following further discussion, our potential interviewee was grudgingly prepared to bring his evaluation as far forward as 2000.⁴

But things were not always so. Let us therefore provide a capsule history of the rise and fall of this term and the set of ideas it represented. The elements of what came to be known as e-commerce were already in place by the beginning of the 1990s in that ideas and practices of electronic exchange and the main problems that needed to be overcome (e.g. security) were already on the horizon and subject to development. For example, there was already a significant infrastructure – the Internet – established over many years by governments, military agencies and computer scientists in universities and industry (Abbate 2000). In addition, there was also a considerable on-line community, in the form of academics who used computer networks for the exchange of ideas, which was strengthened considerably by Berners-Lee's development of the World Wide Web in the early 1990s (Berners-Lee and Fischetti 2000). However, in the mid-

1990s a number of forces conspired to produce a knowledge community that had not heretofore existed based around the notion of electronic exchange. The first of these was very favourable macroeconomic conditions which, as we are easily able to see in retrospect, were in part the result of much easier lending conditions, particularly in the United States (Brenner 2000), allowing both firms and consumers the freedom to buy and sell. In the case of corporations, boosted by a general idea of the knowledge economy enhancing innovation, the cash surplus also made it much easier to be experimental. For example, as Feng *et al.* (2001) have shown, the capital markets in the US became the main driver of research and development in the 1990s, overtaking the role normally performed by internal corporate funding.

The second force was the cultural circuit of capital that, boosted by a general sense that information technology was a millennial invention, proved intent on introducing new ideas and protocols that could freely circulate in business and so produce a considerable profit for the cultural circuit itself. One of the important objectives of the cultural circuit is its ability to convince itself and others that its ideas are worthy. It is, therefore, more accurate to see this process as one of 'rhetorical echoing', in which many different ideas resound around the same concerns and produce a sense of a different kind of world from that which has gone before. In particular, from the mid-1990s, there seemed to be a tendency to herald a new and significantly more profitable era of capitalism than hitherto, one that would operate on a new business model. The sheer speed and convenience of some electronic technologies acted as self-fulfilling evidence for many, which supported the proposition that a new economic phase was hovering into view.

The third force was technology itself. Information technology was becoming significantly cheaper and more user-friendly with the result that, this being combined with the lustre given to it by the cultural circuit of capital, very large expenditures were made. These expenditures were given greater legitimisation from the mid-1990s onwards as general concern grew about the possible consequences for the functionality of computer software on 1 January 2000 (Y2K). In turn, the sheer weight of the sunk costs so produced provided a momentum to find further uses.

The net result of these three forces was to produce enormous rhetorical inflation around what were often minimal phrases and sayings. So, for example, the capital markets suspended normal measures of valuation, and became prepared to advance large sums of money to often flimsy business models in the belief that they would bring about significant financial gains at some unspecified future point. Similarly, the cultural circuit became involved in a rhetorical arms race in which exaggeration became a normal currency. Finally, information technology increasingly framed itself as a creative industry rather than a utility with delusory results. This delusion was particularly fostered by the rise of software as an industry, which many of its denizens seemed to consider was more akin to creative writing than simple mechanics. In general, what we can also see is a blurring of the boundaries between these

different actors as each of them took on some of the characteristics of the other. Thus, for example, financial research analysts specializing in the technology sector increasingly took on many characteristics of the cultural circuit of capital, as they became effective spokespersons and advocates of the sector, and so became celebrities in their own right (Cassidy 2002).

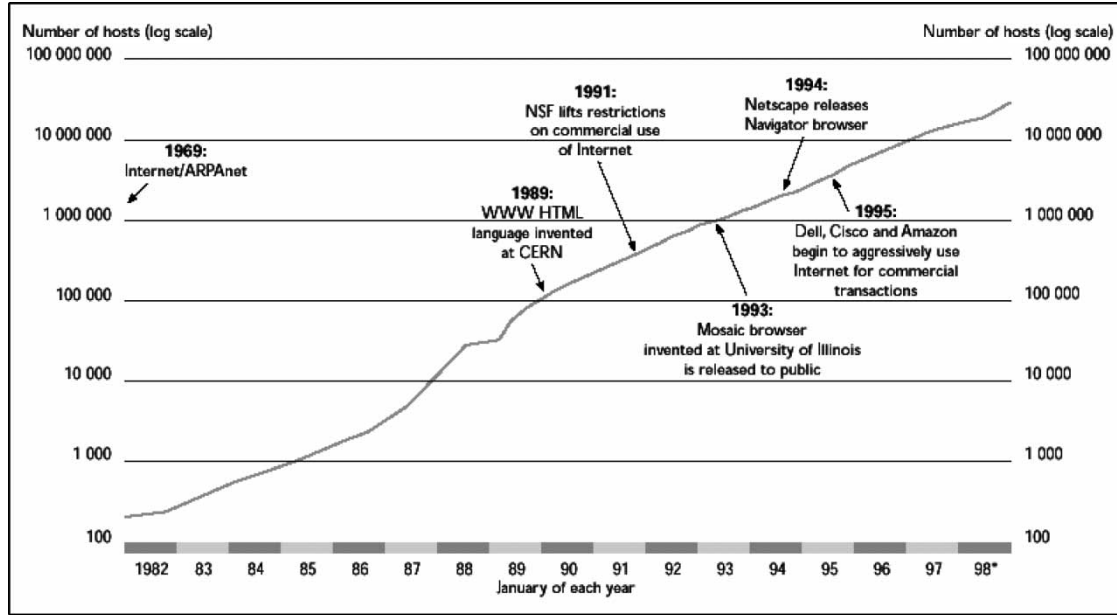
However, although these were conducive conditions within which e-commerce could emerge and evolve, for it to do so in the first place required the development and mobilization of a number of key abstractions so as to provide a rationale and justification for its existence. Two of the most high-profile abstractions were the term 'e-commerce' itself and the influential idea of 'first mover advantage'. We will now deal with each of these in turn.

E-commerce

Although the idea of e-commerce is now taken for granted, it is important to recognize that, as recently as the early 1990s, this term would have been unrecognizable, let alone be a signifier for an entire domain of economic activity. As a neologism, e-commerce has a very recent provenance. Internet-based electronic commerce, the activity to which 'e-commerce' has come to refer, is generally thought to have emerged sometime around 1995, this being the year of Netscape's initial public offering (IPO) on NASDAQ and the year in which the OECD (1999) argues that technology companies (such as Dell and Cisco, for example) began to utilize the Internet for commercial transactions (Figure 1). But, it is possible to trace the term 'e-commerce' back even further, to at least November 1993, and to an article in the Californian paper, the *San Jose Mercury News*, now recognized as one of the first uses of the term in published form.⁵ From this initial appearance, it took another three years before the term made an appearance in any of the scientific journals or magazines tracked by the Web of Science database (Table 1).⁶ Given the one- to two year time-lag that often exists between papers being written and their publication in journals, this would suggest that 'e-commerce' was entering into scientific discourse at around the same time (1994–5) that it was emerging as a distinctive form of practice. Plotting the comparative number of scientific texts which refer respectively to 'e-commerce', 'electronic commerce', and 'electronic commerce' and the 'Internet' reveals that it was not until 1999–2000, following an exponential increase in its use, that the term came to dominate related discourse (Figure 2). Up until this point discussion was more likely to be couched in the more generic language of 'electronic commerce' (French and Leyshon 2004).

First mover advantage

A second abstraction critical to the formation of e-commerce is first mover advantage (FMA), which figured strongly as a central motif of e-commerce



* New methodology used in January 1998.
 Source: Network Wizards.

Figure 1 Growth in Internet host computers and major e-commerce developments
 Source: OECD (1999: 9)

Table 1 Number of texts (journal and magazine articles, book reviews, editorials, etc.) recorded on the UK's Web of Science database that refer to 'e-commerce' and related terms

	Search terms		
	'e-commerce'	'electronic commerce' & 'internet'*	'electronic commerce'***
1992†	–	–	1
1993	–	–	–
1994	–	–	2
1995	–	–	4
1996	9	6	32
1997	12	17	47
1998	21	44	107
1999	126	65	169
2000	294	69	203
2001	301	74	226
2002	310	81	208
2003	387	123	281

Notes

*Documents which refer to both 'electronic commerce' and the 'internet'.

**Documents in this category may not refer specifically to the 'internet', but they do often include reference to related terms such as the World Wide Web and 'the net'.

†Coverage of the Web of Science database from 1983 to the present day; however, 1992 is the first year that any published documents appear which include the terms in question.

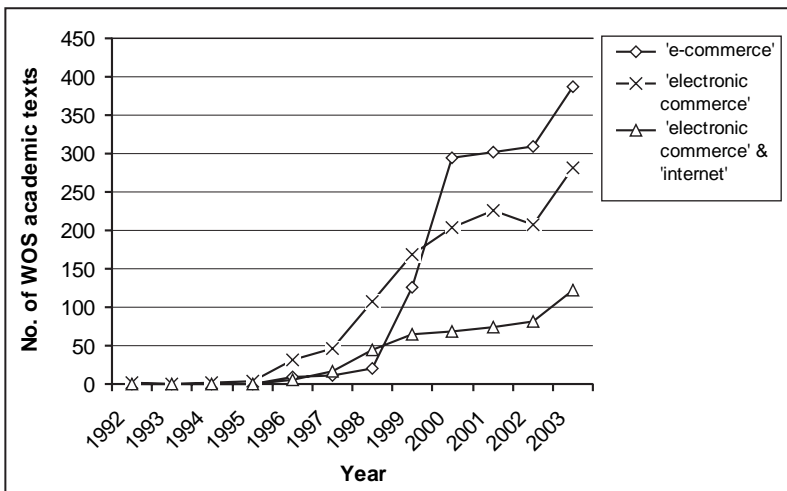


Figure 2 Comparison of Web of Science (WOS) scientific texts with reference to the terms 'e-commerce', 'electronic commerce', and 'electronic commerce' and the 'internet'

and, more specifically, of the dot.com boom. The term itself is closely associated with two other powerful ideas: first, that e-commerce is characterized by significant network effects (i.e. that Internet-based products and services are believed to become more valuable the greater the number of customers use them); and, second, that the Internet provides firms with strong scale effects (i.e. the possibility to scale operations almost instantaneously, enabling relatively costless access to increasing returns to scale) (Liebowitz 2002; Porter 2001). The argument followed that the Internet was likely to be exploited most effectively by those companies able to establish themselves first, swiftly taking advantage of such effects, to the detriment of slower-moving companies that, as a result, would find it very difficult to assail the commercial lead of the first-mover. According to Liebowitz, it was precisely the 'idea that being first is essential . . . a truly pernicious bit of faux wisdom' (2002: 27) that played a significant role in driving the dot.com bubble of the late 1990s, because the idea of FMA 'helped companies throw themselves madly off a cliff like lemmings, thinking they were bound for glory'.

In cataloguing the widespread dissemination and mobilization of FMA, and similar terms such as 'winner takes all', Liebowitz (2002) cites the reports of stock-market analysts (such as the now infamous Mary Meeker),⁷ interviews with a plethora of dot.com CEOs and CTOs (chief technology officers) and various Internet management gurus. In addition, the height of the dot.com boom was also marked by articles in *The Economist* (2000) and *The Financial Times* (2000), for example, reporting on the network and scale effects of the Internet and the resultant tendency towards the development of e-commerce monopolies. However, just as the idea of FMA appeared to have been elevated to the status of *fact*, the dramatic dot.com collapse heralded an equally dramatic re-evaluation of the e-commerce glossary. From cornerstone of the lexicon of e-commerce, FMA had, within a year, been relegated to the status of e-commerce myth in articles in the *Harvard Business Review* (Porter 2001) and in *United Nations* (2001) reports. Nevertheless, a study by the consulting firm Accenture (2001: 18) suggested that in the boardrooms of European firms at least FMA continued to have influence, with 'only ten per cent of European businesses say[ing] that they have less confidence in the idea of the FMA than they had a year ago'.

How did the idea of FMA rise to such prominence? In attempting to answer this question Liebowitz prefaces his argument with the claim that '[s]tock-market analysts usually do not create their own theories – they lack the training to do so. Instead, as Keynes wrote, they usually take ideas, right or wrong, from some academic thinker' (Liebowitz 2002: 26). In the case of FMA, and of allied concepts such as network and scale effects, Liebowitz argues that much of the rhetorical power of the term lies in its connection to the relatively new and, in his opinion, dangerously under-theorized economic theory of lock-in. Citing the examples of Shapiro and Varian's (1999) influential text *Information Rules* and, in particular, 'adoring stories' about the work of the economist Brian Arthur – 'the pied piper of lock-in'

(Liebowitz 2002: 29) – in magazines such as *Fortune*, *Wired* and Booz-Allen and Hamilton's *Strategy & Business* during the mid-1990s, Liebowitz argues that, just as the theory of lock-in has provided the intellectual justification for such academic accounts, so, in turn, the likes of Arthur and Shapiro and Varian have provided the legitimization for more popular and populist '[t]echnology writers [such as Kevin Kelly, who] then ran (or perhaps flew) with these ideas' (Liebowitz 2002: 30). For Liebowitz then, the phenomenon of the dot.com boom, its subsequent collapse and the resultant material impacts can largely be attributed to the significant purchase of one particular and, in his opinion, faulty economic abstraction. As a longstanding critic of the theory of lock-in as championed by Arthur, Liebowitz presents his own alternative account, one which differentiations between strong and weak forms of lock-in.⁸

The manifestations of abstractions

FMA and other abstractions began to circulate widely from the mid-1990s onwards. As they did so, they helped to stabilize and propel e-commerce as a term and as a consequent set of practices throughout the corporate sphere. This was manifested in a number of ways. First, as Feng *et al.* (2001) have argued, the pitching of business models to potential investors from the financial markets became a particularly important process. This had the added bonus of not only spreading the gospel of e-commerce but also legitimating the term itself. E-commerce became a formal incantation, with attendant performance rites and modes of address (Shapin 2002), which signified a desirable and profitable future. Second, a series of specialist e-commerce knowledge institutions began to emerge. These included the specialist arms of established management consultancies, as well as the rise of boutique operations such as Jupiter Media Metrics, Forrester and Gartner, which produce large volumes of data and analysis on Internet use – 'metrics' – which are used to attract advertisers and guide Internet strategy. The third manifestation was the tendency of new and established technology firms to start offering complete e-commerce solutions. These vendor firms would provide a suite of software and hardware, along with appropriate advice, that would enable clients to be able quickly to install an e-commerce operation, and included firms such as Sun, Cisco, Nortel and others. The fourth and final manifestation, which was a product of the third, was the introduction of e-commerce at the corporate level. This took the form both of the now archetypal dot.com start-up, which was usually funded by venture capital and operated on the basis of moving towards an IPO in the not-too-distant future, in addition to the addition of more or less extensive e-commerce facilities to established 'bricks and mortar' companies in response to the competitive threat posed by the new start-ups.

At this point we need to return to the question of virtualism. For what becomes clear from the example of e-commerce is that in modern economies

abstractions, concepts, theories and ideas are produced by a whole network of actors and not just by academic economists. In turn, this network of actors has been able to produce its own economic knowledges that redefine the boundary of what is counted as 'economic' and produces important new motive economic forces. For example, it could be argued that e-commerce was produced as an idea by non-economists but was then subsequently taken up by academic economists rather than vice versa.⁹ What we argue is actually taking place here is a clash of conventions and orders of worth. One could also argue that because many of these economic ideas are more easily accessible than those of conventional economics, their very transparency and portability should be regarded as an economic force in its own right, particularly given the contemporary eagerness of some managers to consume new ideas, which is in itself, at least in part, an historically specific phenomenon (Huczynski 1996).

The practical roots of virtualism

The literature on virtualism tends to neglect or minimize a certain set of knowledge practices. It privileges the flow of information from 'top' to 'bottom'; that is, from abstraction to practices. In the case of e-commerce, we believe that such an attitude would be a signal error. The problem is that the virtualism literature signifies a division of knowledge labour that does not easily apply to large parts of the economic world. For example, consider the case of FMA discussed earlier. On the one hand, FMA provides a good illustration of the significant role virtualism has played, and continues to play, in constituting the sphere of e-commerce. Further, if we are to take the Liebowitz interpretation at face value, then the story of first mover advantage appears to provide a very good example of virtualism as outlined by Miller, Carrier and others. However, we want to argue to the contrary that this case provides an important illustration of the limitations of the contemporary understanding of virtualism, for at least three reasons. First, on closer inspection FMA actually illustrates the critical role played by a whole range of actors other than academic economists in the representation and re-representation of e-commerce. For the idea of FMA to have had such effect it required the active engagement of the cultural circuit of capital and, as such, illustrates the need to take seriously the agency of non-academic analysts (like Mary Meeker) and texts (such as *Wired*, and the output of populist writers such as Kevin Kelly). It may well be that in some cases (such as the allocation of bandwidth for 3G mobile phones, for example) the wider cultural circuit of capital has acted primarily as a conduit for the ideas of economists, but the assumption by Liebowitz that financial analysts lack 'appropriate' training to create their own theories illustrates the dangers of making *a priori* assumptions about the agency of the networks of virtualism.

The problem of agency leads onto a second issue: that of the difficulty of attributing clear causality to processes of virtualism. Undoubtedly, the theory

of lock-in has played an important role in the story of FMA, as reflected in frequent references to the example of the case of Betamax versus VHS (see, for instance, *Financial Times* 2000). However, whereas Liebowitz assumes this to be the consequence of the powerful purchase economists and economic theory have on the material world, it could quite as easily be interpreted as a reflection of the ability of other actors in the cultural circuits of capital to translate (Callon 1991) the discipline of economics for their own purposes and objectives. Thus, reference to the theory of lock-in and FMA by stock-market and technology research analysts, for instance, could be interpreted as an endeavour to legitimate their activities by making connections *back* to abstract economic theory. At the very least the difficulty of attributing causality in the case of FMA suggests that virtualism, certainly in the context of e-commerce, is a much more distributed process than conventionally envisaged.

Third, and finally, Liebowitz's critique of the theory of lock-in also draws attention to the difficulties of distinguishing between abstract and practical ideas. According to Liebowitz, the theory of lock-in relies for much of its rhetorical power on two commonly cited examples – the example of the QWERTY keyboard and that of the success of VHS *vis-à-vis* the technologically superior Betamax video format – both of which Liebowitz seeks to expose as myths. Leaving aside the veracity of either of these claims, the examples of Betamax and QWERTY suggest that lock-in relies significantly upon half-way abstractions, that are more than examples but are less than theories. In a sense, VHS and QWERTY *are* the theory of lock-in. Thus, the theory of lock-in could be interpreted as a case of practice turning up as theory, just as easily as an example of the increasing influence of economic abstraction.

Indeed, the QWERTY and VHS exemplars are representative of a process that accelerated in the 1990s, where practices were lifted out of their context, stabilized through abstraction, transformed into templates for action and then inserted back into practical contexts as a set of ideas to be applied. It was this process, which was undertaken principally by actors within the cultural circuit of capital, that enabled the idea of e-commerce to take on the form of a more or less immutable mobile. So, alongside the processes of virtualism that writers like Miller envisage, there is a parallel process, because of the fluidity of current informational structures, that has become rather more important as a propulsive force. The interventions of the cultural circuit of capital, or certain parts of government, and even of consumers, have produced knowledge flows that are greater and more mobile than in the past. So, for example, there is a large general audience for management ideas, for ideas from science, as well as for certain technological ideas within business generally. This means that specialized knowledge of one form or another can increasingly become over-the-counter knowledge. In particular, this means that small and often incremental innovations are more likely to make their way into discourse at an earlier stage, and that the process of what might be called 'tinkering' is able to become formative in a general way (Mokyr 2002).

Practical knowledge is more open to theoretical appropriation and reworking than in the past. In other words, practices are more likely to turn up as theory nowadays, and we suggest that within the realm of leading-edge technological development this is more likely to be the case because it is an arena that tends to be populated by a set of highly self-reflexive actors who are likely to frame their practices theoretically.

One of the aspects of this process, which is particularly important, is the very use of *examples* drawn from practice as just touched upon. This common business school practice has, in a sense, infected theory, and has produced a half-way house in terms of abstraction in which the example counts as more than example and less than a theory. They are more like exemplars and calls to action and replication. For example, the work of several leading e-commerce consultants is replete with such exemplars, which are stitched together in an attempt to make a convincing case that a new mode of business has come into being. These, in turn, were part of a more general style of management book that became common in the 1990s, a kind of theoretical catalogue with examples used as advertisements. However, what is interesting about work on e-commerce by consultants published in the 1990s was not only how sparse the examples were, but how thinly they were drawn (see, for example, Evans and Wurster 1999; Hagel and Armstrong 1997). Because there were so few successful examples to draw upon many consultants used the limited number of examples they could find, but sought to stabilize their vision of the near future by repeated use of the transitive verb 'will' (as in, 'The explosion of richness and reach will change the bases of competitive advantage and intensify competition at all levels of the supply chain' (Evans and Wurster 1999: 191), or, 'infomediaries will help clients access detailed information about individual products or services through their profiling and agency services' (Hagel and Singer 1997: 234), to give just two examples from these books: there are many, many others (French and Leyshon 2004).

From work of this kind a particular lexicon of terms emerged which sought to make a connection back to abstract economic theory and thereby to stabilize still further the edifice of e-commerce. Thus, terms such as disintermediation were borrowed from financial analysis (French and Leyshon 2004), while others – which included FMA, but also concepts such as network effects and scale effects – were utilized to justify the economic advantage that e-commerce would deliver. And it is clear that when concepts and exemplars begin to circulate widely and start to connect with one another then they can have powerful effects, creating what might be described as 'organizational refrains'; that is, stories of organizations taken up as exemplars of success or failure. These stories are repeated so frequently within the wider e-commerce knowledge community that they become akin to refrains (cf. Deleuze and Guattari 1988; French 2002: s. 519–20) that circulate widely at particular times and spaces. Such organizational refrains can be rhetorically powerful, and include examples such as Napster, in terms of the music industry

(Alderman 2001), Wingspan, in the case of Internet-banking in the United States (Martin 2002), and Boo.com, in the case of the fashion industry (Malmsten *et al.* 2002). Organizational refrains of this magnitude are such that the very mention of the name of the organization signifies strong ideas on the 'right' and 'wrong' ways to do e-commerce. And in tracing the genealogy of such mobiles it is apparent that a much more diverse range of actors, beyond formal economists, are involved in their production, circulation and interpretation. An illustration of the rhetorical power of such organizational refrains was provided during an interview in the United States with the Managing Director of Internet Strategy at a large and prestigious American bank. While discussing the evolution of the bank's retail Internet services it became apparent that prior to a recent major organizational rethink – the 'e-catalyst initiative' – e-commerce strategy within the bank had been strongly influenced by the idea of Wingspan:

Interviewer: In terms of that e-catalyst initiative was that linked to the . . . [merger of bank 'A' and bank 'B' to form the current bank]?

Managing Director of Internet Strategy: Well in a way, I mean it followed it. It was, like, in a couple of ways, one there was a fair number of pretty crazy projects out there [in the bank], and crazy ideas, especially on the retail side. So it was partly reactive in that way. You know Wingspan? Do you know Wingspan?

Interviewer: No.

Managing Director of Internet Strategy: First USA, which is the credit card unit and a very large credit card issuer, set up an on-line only bank called Wingspan. And that was really fashionable in the industry to look at that [Wingspan] as: 'they really get it!' And therefore there was a movement [within the bank], it was in some ways tied to the coming together of people, and people staking out positions, and there was a movement internally to do that [adopt the Wingspan model], and we definitely had to push [to halt this]. It was a dumb idea, it was completely evident to us there was just no leverage to be gained from it. But that had already been squashed by the time the e-catalyst stuff started, but I think that added impetus to say, 'Let's really rationalise what we're doing'.

(Interview with Managing Director of Internet Strategy,
large US bank, September 2002)

Going on to highlight what he saw as the potentially disastrous consequences of being seduced at the time by the myth of Wingspan – and by default his own good sense in being able to see through and resist its lure – the Managing Director also stressed the ubiquity of this particular refrain within the US banking world:

Everybody was thinking it [that the Wingspan model was the right way to go]. And some people did it, they just didn't re-brand it, I mean Citi [a rival US bank] did it in a fact, completely unsuccessfully, it was called e-Citi, Citi FI,

originally . . . and really almost no pay off. . . . I don't know if they spent a billion [dollars], but I think it was close.

(Interview with Managing Director of Internet Strategy,
large US bank, September 2002)

Conclusions

This paper has looked at the constitutive role of virtualism within the development of a discursive domain called e-commerce. It has argued that the conventional definition of virtualism needs to be extended to include both practices that evolve continuously over time as well as processes of abstraction that are not conventionally regarded as belonging in the realm of the theoretical. While evidence has emerged of ideas being taken up by, and influencing the form of, Internet-based operations, such evidence sits uncomfortably with the theory of virtualism as currently conceived. There are many different types of powerful mobiles (Latour 1987), some of which bear close resemblance to formal economic ideas and concepts (such as disintermediation; see French and Leyshon 2004) whereas others (such as exemplars and organizational refrains) bear very little resemblance to the sorts of abstractions prioritized in the theory of virtualism. We have looked at the interplay between virtualism and e-commerce and argued that what we now understand as e-commerce was brought into being through a combination of wider economic processes as well as purposive acts undertaken by both the financial and cultural circuits of capital which mobilized already existing materialities within the wider business environment.

Therefore, it is not possible to attribute the emergence of e-commerce to the mobilization of abstract economic theory alone. An explanation requires the incorporation of the actions of a more practical group of actors that make up the cultural circuit of capital. However, even when extended to include a wider register of actors and abstractions, virtualism alone cannot fully account for the rapid rise of e-commerce, for at least two reasons. First, e-commerce was made possible during the 1990s by a set of highly conducive macroeconomic conditions as well as a cultural context that was particularly receptive to ideas of technological progress. Second, management gurus, consultants, business schools, media and journalists represent just one particular group – albeit a significant group – of actors within a wider 'e-commerce knowledge community'. The range of actors and institutions involved in interpretative work around the idea of e-commerce and the new economy additionally incorporates: regulatory and governmental institutions; website designers; information technology vendors (hardware and software); Internet service providers and intermediaries; institutions involved in the development and legitimation of e-commerce metrics; and so on. Therefore, while the dot.com boom, which was integral to transforming e-commerce from idea to reality, owed much to the power of abstraction and to the circulation of certain forms of propositional knowledge, the practical translation of the Internet into a viable space within which it is possible to do business owes at least as much to

the mobilization of various forms of mundane knowledge; that is, knowledge of installation, maintenance, repair and logistics.

By the beginning of the twenty-first century the idea of e-commerce was losing its rhetorical force. In the United States, in particular, it had become an increasingly redundant – indeed passé – concept, whose usage suggested negative cultural capital. Those who were still interested in the operations formerly known as e-commerce increasingly turned to other metaphors for sustenance. Increasingly these operations were likened to basic utilities, such as trains or electricity (Spar 2001), suggesting that e-commerce had been normalized to such an extent that the description of practices as ‘belonging’ to e-commerce has begun to lose its representational/inspirational power. Thus, in many areas of business e-commerce has been superseded by terms such as e-business, m-commerce, customer relationship management (CRM) and so on.

What brought about this loss of discursive power? The first reason was simply the recession. After spring 2000, the rhetorical inflation of the 1990s was replaced by a rhetorical deflation in which all business ideas were treated with a more cynical scepticism, which was a product of disappointment and more careful attention to the bottom line, as normal models of asset valuation were reasserted. Indeed, as time progressed, it was revealed that many of the claims made for the potential of e-commerce were based on dubious if not erroneous data. For example, one of the attractions of e-commerce was the projected rate of increase of Internet traffic, as measured by the number of individuals and households going on-line. It became received knowledge that Internet traffic was increasing at an exponential rate, doubling every three to four months (Coffman and Odlyzko 2001), a ‘fact’ which was replicated in all manner of graphs and tables within various reports and business models and, most notably, in a key report by the US Department of Commerce within which it is unequivocally stated that ‘[t]raffic on the Internet has been doubling every 100 days’ (US Department of Commerce 1998: 2). However, subsequent efforts to trace the source of this claim reveal that most of these representations of Internet traffic growth were based on figures emanating from a subsidiary of World Com, UUNET, which were not only specific to 1995–6 – a relatively early stage in the take-up of e-commerce services – but whose veracity was subject to increased scepticism following the collapse of World Com as a result of accounting fraud. Yet, for a number of years, this flimsy assertion took on the form of an established truth among telecommunications companies, prompting what *The Economist* (2002: 62) described as ‘an orgy of network construction for a deluge that never came’.

The second reason was that many e-commerce practices were no longer novel and, as they sank into the background of business practice, so they no longer needed to be highlighted in any special way. This tendency was reinforced by the fact that many so-called e-commerce business practices were, in truth, rather mundane ways of moving commodities from one location to another. Thus, for many products it became clear that companies were treating

e-commerce as nothing more than electronic mail order – although often with much worse logistics and after-sales service. Of course, this post-installation visibility of e-commerce varies between sectors. In some sectors, like financial services for example, it is now a fully accepted mode of operation that has become procedural. In others, such as the music industry, the consequences of what might seem like small changes are so wide-ranging that they have, as yet, not been fully assimilated (French *et al.* 2004; Leyshon 2003; Leyshon *et al.* 2005).

It might be possible to argue that e-commerce was something of a failure, given the account that we have presented in this paper. However, we would argue the opposite. Despite much of the rhetoric, the practices of e-commerce have proved to be highly influential but in mundane ways that it is very difficult to ‘brand’ as particularly novel or particularly earth-shattering. This is because most of these practices have proved to be logistical frameworks that, by their very definition, *should* sink into the background if they are working successfully (Thrift 2003). Therefore, we would argue that the effects of e-commerce will persist and become more pervasive precisely because they are, in many ways, becoming less remarkable within the contemporary business environment. And yet, these kinds of logistical frameworks have provided some of the most profound changes in business practice which, precisely because they go unnoticed by so many theoretical commentators, will provide an unquestioned ground upon which future examples of virtualism will be built. The most abstract abstractions are often not abstract, because they are culturally coded as material that is already in being, and articulate understandings that were previously tacit; they exist as systems of positioning that guide action but do not have to be accounted for.

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Notes

1 According to Lessig (2001: 75), the idea of selling radio spectrum can be traced back to work undertaken by the economist Ronald Coase for the US Federal Communications Commission in the 1950s. See, in addition, Guala (2001).

2 This is evidently the view from the ESRC, which proudly acclaims the work of the Centre on its website (www.esrc.ac.uk), and from commentators such as Will Hutton, who claims that the Centre’s director, Ken Binmore, should be given an honour for raising so much money.

- 3 A key aim of this ESRC-funded study, entitled 'Putting e-commerce in its place', was to identify and map out the contours of what we term the e-commerce knowledge community. To this end over 100 interviews were conducted with actors, institutions and senior managers in companies in the United States and Europe between November 2001 and January 2004.
- 4 It was significant, however, that using the term e-commerce did not produce strong negative reactions in the UK and Europe, where the term still possessed rhetorical power, revealing a trans-Atlantic divide in the rate at which business ideas were turned over.
- 5 The *San Jose Mercury News* article is the earliest published use of the term cited by the *Oxford English Dictionary* (<http://dictionary.oed.com/>). In the article, entitled 'Smart Valley to get \$8 million: goal of U.S. grant is to help turn Internet into electronic marketplace', Jay Tenenbaum – later to become Chairman of CommerceNet and whose endorsement as such would appear on the inside sleeve of Shapiro and Varian's (1999) canonical e-commerce text *Information Rules* – discusses the importance of a US Government grant awarded to Smart Valley Inc. for the CommerceNet Initiative, designed to 'jump start e-Commerce' in the San Francisco Bay Region (Bank 1993: 8D).
- 6 The ISI Web of Science database includes details of approximately 8,500 such texts from around the world.
- 7 Meeker was a technology analyst for investment bank Morgan Stanley. For a discussion of her role in the dot.com boom, see Cassidy (2002).
- 8 The assumption presumably being that, had the likes of *Fortune*, *Wired* and *Business & Strategy* magazines showcased Liebowitz's work in the way that they did that of Arthur, the outcome might have been very different.
- 9 See, for example, the work of Quah (2000).

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Louise Crewe is Professor of Human Geography at the University of Nottingham. Her interests lie in the areas of fashion, retailing, shopping and consumption with particular focus on commodity biographies, value and second hand exchange. She is the co-author of *Second Hand Cultures* (with Nicky Gregson, Berg, 2003).

Shaun French is Lecturer in Economic Geography at the University of Nottingham, having previously worked at the University of Bristol. He has published work on the geographies of business knowledge and praxis.

Andrew Leyshon is Professor of Economic Geography at the University of Nottingham. Previously he has worked at the Universities of Bristol, Hull and Wales. In addition to investigating the origins and impacts of e-commerce, he is also currently researching the formation of ecologies of retail financial services. He is the author of *Money/Space: Geographies of Monetary Transformation* (with Nigel Thrift, Routledge, 1997) and co-editor of *The Place of Music* (with David Matless and George Revill, Guilford Press, 1998) and *Alternative Economic Spaces* (with Roger Lee and Colin Williams, Sage, 2003).

Nigel Thrift has taught or carried out research at the Universities of Cambridge, Bristol, Leeds, Wales, Uppsala, UCLA, the Australian National University and the National University of Singapore. He is Head of the Division of Life Sciences at the University of Oxford. Most recently, he is the author of *Cities* (with Ash Amin, Polity, 2002), *The Cultural Geography Handbook* (co-edited with Kay Anderson, Mona Domosh and Steve Pile, Sage, 2003) and *Patterned Ground* (co-edited with Stephan Harrison and Steve Pile, Reaktion, 2003). He is currently working on informational ecologies and body technologies.

Peter Webb is Lecturer in Media Studies in the Department of Sociology at the University of Birmingham. He previously worked at the University of Bristol. He has published work on popular music and social theory. He is also a musician who releases material under the name of 'Statik Sound System'.