THE PRACTICE OF BUSINESS MODELS

Competitive Paper

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Abstract

This paper examines the concept of business models. Through the presentation of secondary data from the recorded sound industry, we explore how business models change over time. The history of the recorded sound industry, from its birth in the 1870s shows how technologies, market offerings and the network architecture generate change as different actors play their part. The story raises three important questions; What are business models? Where are business models situated? and How do business models happen?

Next the paper identifies technology, market offering and network architecture as the three core elements of business models and presents them as a framework for understanding business development in manufacturing and service settings. Drawing on concepts from Technology and innovation studies, industrial marketing, operations and service strategy, and evolutionary economics, the paper explicates multiple dimensions of each element. Then, adopting a practice-based approach, we suggest that individuals, firms and markets form embedded systems within which multiple overlapping business models (and multiple versions or portions of business model) can be considered as constituent parts. In this way, the business model is understood as having agency to shape the actions of actors; but in turn the actions of actors can shape the business model. Finally, understanding business models as a constituent part of a business model we ask, what do business models do? Our analysis suggest that business models shape the practices and spaces that form markets and are likely to be contingent, and context specific.

Keywords: Business Models, Strategy, Management Practices

Introduction

The value of business models is thought to lie in their ability to capture important elements of organisational strategy and make them form a coherent and compelling whole (Timmers 1999). Ten years ago, the notion of business models was the preserve of internet-based businesses. Today, their application has spread far beyond the virtual world and reference to business models can be found in the business press across such diverse sectors as finance, engineering, computing and music. To date, the vast majority of research on business models has adopted an essentialist perspective, focusing on business models as a description of how business is done (Chesbrough and Rosenbloom 2002; Magretta 2002) and the identification of the underlying element or components that detail what the business model is (Osterwalder et al. 2005; Weill and Vitale 2001). This stream of research understands business models as a representations of reality; an objective reality of the firm and its markets. In this way the business model is understood to represent a truth of the way a particular business *does* (or should) work but is seen to reside outside of the economic unit (the firm). Despite the valuable contribution of this literature, three key gaps can be identified.

First, as Dagonava and Eyquem-Renault (2009) observe, the business model literature has limited theoretical underpinnings. That is to say, while the business elements are identified, the theoretical underpinning of the elements and the relationships between them is not explicit. This is perhaps not surprising given the size and interdisciplinary nature of the task. Business models emphasise the holistic notion of doing business. This is in contrast this the trend pursued by managers since the 1850's were the firm structures have adapted towards smaller, more administratively manageable functions (c.f. Chandler 1969; Edmondson and Nembhard 2009). Not surprisingly, the research and teaching of management disciplines have grown up in much the same way; operations, marketing, finance etc. This focus on functionality, representing a shift from the holistic perspective of business, has been recognised as a limitation to the way business and management has been conceptualised and taught in business and management schools (Pfeffer and Fong 2002). As Mintzberg and Gosling (2002: 28) comment, *"contemporary business education focuses on the functions of business more than the practice of managing*." In addressing this gap, we adopt an interdisciplinary approach to explicating the underlying theory of business models and where possible, use a practice lens to do so.

Second, the literature does little to explain how managers develop, innovate and practice business models to effect the growth and performance of their firm. This raises the question as to our understanding of the sites of business models. Do business models occur at the level of individual actors, firms or at the market level? The concept of business models has been applied at all these levels; by Dagonava and Equem-Reanault (2009) to understand how individuals (entrepreneurs) interact to develop their business model; by Chesbrough and Rosenbloom (2002) at the firm level, and by Mahadevan (2000) to understand the e-commerce at an industrial or market level. What is consistent amongst nearly all business model literature is the recognition that business models evolve through the interactions of individuals in social groups, both within the firm and within the wider business network. Schatzki (2005) argues that as individuals are embedded in both the social lives of firms and markets, we need multiple sites of analysis when trying to understand organisations and what they do. Yet despite this valuable observation, we know little about the way business models exist and evolve at multiple levels and perhaps in multiple forms in these embedded systems. In this way, understanding something about the sites of business models seems relevant and pertinent to generating deeper insight into how business models happen.

The third concern of this paper then, is how do business models happen? If business models are as we claim, about framing action, to address this question we need to understand more about how managers conceptualise, theorise and enact change in organisations and markets. Birkinshaw, Hamel and Mol's (2008: 825) work represents one of the first attempts to systematically examine *"the invention and implementation*

of management practice, process and structure... intended to further organizational goals". By focusing on the specific actions individuals take in order to lead to the emergence of management innovation, Birkinshaw *et al.'s* (2008) research makes two important contributions. First, it suggests that both internal *and* external actors have a significant influence on the emergent management practices of a firm; and second, it suggests that the process of management innovation does not always proceed as a linear sequence of activities from motivation through to theorization and labelling (also see, Pfeffer and Sutton 2000). This is concordant with the descriptions of how business models are developed, presented and divulged to different stakeholders for different purposes. In this way, the *business modelling* process can be understood to be both influencing, and being influenced by not only internal actors within the firm developing the business model, but also by external actors within the business network – because of this complexity it seems unlikely that a linear sequence of activities could ever exist. Dagnaova and Eyquem-Reault (2009) show how the business model of an entrepreneur evolved and changed over time as the different stakeholders commented on, bought-in-to and disengaged with their original business model. By divulging different parts of the business model to investors, suppliers and customers, the business model (or fractions of it), become sited in the business models of others. Thus, the sites of business models tells us something of how they happen. However, Dagnaova and Eyquem-Reault (2009) focus on the materiality of the business model; the form it takes in formal documentation, PowerPoint slides and targets. They pay far less attention to the management practices that perform, realise and evolve the business model as it happens (c.f. Schatzki 2006). This has implications for the practice of business models as it suggests that they are necessarily dynamic in nature (Mason and Leek 2008) and that the business model and their practices might interact in and iterative and evolutionary way.

Taking an historic perspective on the recorded sound industry, this paper sets out to explicate what business models are, their sites and how they happen. In doing so, we explore the underlying theory behind the three business model elements consistently identified in the business model literature; technologies; market offering and network architecture. Drawing on an understanding of how managers practice business models within and across the business model elements identified; we study here, business modelling in action (c.f. Latour 1987). We argue that business models can be usefully understood as bundles of practices that allow managers to translate, adapt and act in contextually appropriate ways. The paper suggests that the management practices that constitute business models require a different emphasis on technologies, network architecture and market offerings; that shifts from element to element over time; varies by market; and is affected by the interactions of the practices associated with other components within the business model framework.

The following section draws on Dowd's (2002) description of how Edison's inventions of the phonograph began a series of evolutions of business models over time, in the recorded sound business. This historical account identifies the three elements of business models (technology, market offering and network architecture) and illustrates the interactions between the elements of the business model that had to be managed in order to practice and evolve the business model and its markets.

Business Models in Action: The Recorded Sound Industry

Thomas Edison patented the phonograph in 1877. For the first time, this enabled the recording and playback of short passages of sound. The phonograph recorded sound onto a fragile, tinfoil cylinder, so recording quality was poor and the durability of the recordings was such that the sound could only be played back a few times before the cylinder wore out. At that stage Edison identified a wide range of possible applications, of which music recording was only one. Others included recording the last words of dying relatives and recording telephone conversations (the telephone had recently been invented by Alexander Graham Bell).

The first commercial use of the phonograph was through demonstration by travelling entertainers, principally for its novelty value. Edison sold the phonographs to a network of entertainers who in turn charged for attendance at demonstrations. For a short period, the entertainers made large sums of money, as did Edison through royalties and a percentage of the exhibition fees, but the novelty soon wore off with the customer.

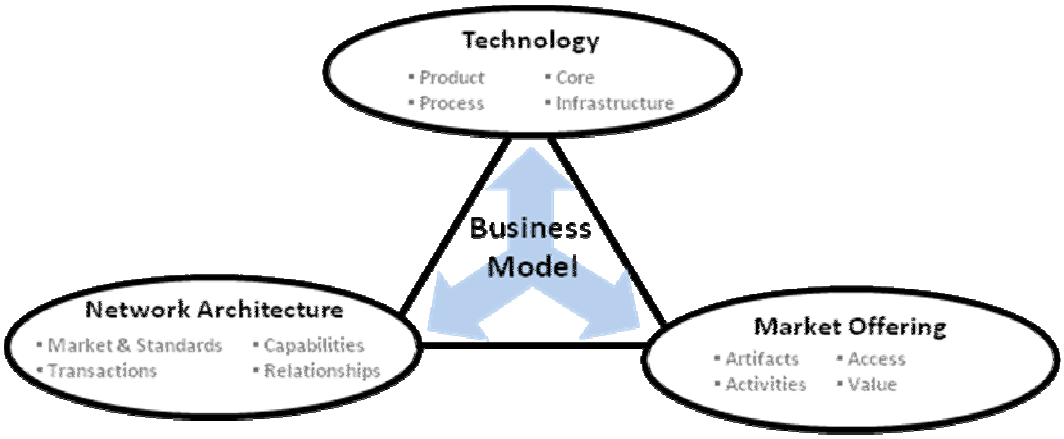
To overcome the fragility of the technology - tinfoil cylinders - wax cylinders were introduced, and the next commercial use of the phonograph was as a business dictation machine. Being short of capital, Edison sold the patent for the phonograph to Jesse Lippincott, while retaining the rights to manufacture. Lippincott set up a network of regional licensees who leased the machines for $40 per annum – a business model explicitly imitating that of the American Bell Telephone Company. However, commercial success was limited, and some of the agents who leased machines, created a new market offering and started to use the phonographs to play recorded music. Some agents set up 'phonograph parlours', where customers could pay a nickel to listen to a tune. This quickly became the major revenue earner and, with the development of more easily duplicated, moulded wax cylinders, the sale of pre-recorded music took on much greater significance. Then, as phonograph technology was improved and it became possible for consumers to operate the machines, sales of machines and cylinders to private households became the more significant market. At this stage, the production of media and playback equipment became separated as industry standards pertaining to playing speeds and cylinder and then disc size became established. This was the business model for the next eighty or ninety years, albeit that phonographs were replaced by gramophones, and cylinders were replaced by discs.

Jumping to the 21st century and to 2008, and the recorded music industry finds itself, once again, searching for new ways to generate revenues; threatened by declining CD sales and the increasingly prevalent assumption among younger music enthusiasts that music should be free. Amongst this market sector, illegal downloads are acceptable (The Economist, Anonymous 2008). In response, Nokia have released their *'Comes With Music'* range of mobile phones. Subscribers pay a significant price for the handset and, in return, have an *'all you can eat'* entitlement to download unlimited music from the Nokia online music store for the period – 12 or 18 months – of their initial contract. The handsets are rather similar to Apple's iPhone: it seems unlikely that Nokia would gain significant sales by virtue of the appearance and functionality of the physical artefact alone. What *seems* critical here is the *'Comes With Music'* market offering. This is made possible by collaboration between Nokia and the four major music labels. Crucially, this market offering bears many of the hallmarks of a innovation observed in the business model literature (c.f. Chesbrough and Rosenbloom 2002; Cusumano 2008; Pohle and Chapman 2006). The *'Comes With Music'* offering is *inter-organisational*, being dependent upon the deal between Nokia and the major music labels; involves a shift in the *price-carrier* (Normann 2001) from the 'tune' (as was the case in Apple's iTunes business model), to the purchase of the phone itself in the case of Nokia's "Comes With Music" business model. Nokia's market offering was a response to what is in essence a technological *product* innovation by Apple, who launched the iPhone in 2007, building on the technology of the iPod music player.

The recorded music business vignette involves a fascinating interplay between innovations in business model technologies, market offerings, and the network architectures (Normann 2001). Edison developed a rudimentary product technology. This initially had no saleable form as an artefact – was not translated into an offering – and no Business Model existed, notably because no link had been forged between the product technology and a market that would value it and pay for it. The first offering to be delineated was the performance by a travelling showman, which attached the product technology to an existing distribution network (the entertainers) and market form (pay per performance) and was able to operate by the transfer of capabilities (i.e. how to operate the equipment) to the showmen. A revenue model involving machine sales, fees and royalties enabled Edison to make money for a while.

Incremental product and process innovation led to a more reliable machine. The largely unsuccessful Business Model of leasing machines for use in business dictation gave way, to the innovation (recorded music) that came *from within* the 'distribution' network proved profitable. Two offerings were developed and existed in parallel: (i) the service-based phonograph parlour and, (ii) the product-based phonograph-and-recording sales offering. Each had an entirely different revenue model. Thus the history begins with an emphasis on technology innovation, shifts to innovation in the market offering i.e. business dictation, then network architecture innovation – actually the adoption of a network architecture from elsewhere. From that network architecture came a subsequent innovation in the market offering – recorded music – that eventually made money. This, in turn, drove volume and the incremental product and process innovation that made full industrialisation possible. The business dictation market offering might be seen as 'transitional object' – one which, although eventually discarded, was an essential step on the way to the more successful outcome because it created the network from which the recorded music offering and Business Model emerged (de Geus 1988).

Figure 1: Business Model Elements



This history and other more contemporary examples are drawn upon to develop the general framework shown in Figure 1. Accordingly, the practice of business models is centred across three elements: each is broken down to explore the theoretical basis and the practices that relate and entangle them. We argue that an understanding of these elements and how they relate to one another is essential to an understanding of management innovation. We suggest that the management of any firm is about shifting activity and emphasis from one element to another, and understanding how such shifts may be important competitive moves in themselves. Importantly, we suggest no particular sequence between the elements: as the recorded music example suggests, there is a complex interplay between major innovations in all three areas (Miller et al. 2008). We now discuss each in turn.

The Elements of Business Models

The first use of the term 'business model' can be traced back to the 1950's (Bellman and Clark 1957) but it is only in the past decade that the term has become a tenet of academic interest (Schweizer 2005). While business models have been given numerous definitions (Amit and Zott 2001; Linder and Cantrell 2000; Magretta 2002; Morris et al. 2005; Yip 2004), three common elements can be identified consistently across the business model literature: technology, network architecture and market offering (see Table 1). Yet these elements have not been explicitly linked through theory building. Rather, they represent an emergent understanding of how managers conceptualise business models (see for example, Amit and Zott 2001). The remainder of this section explores the theory behind the business model elements and, where applicable,

draws attention to the management practices that are discussed in the extant literature. Were appropriate, we draw parallels between the theory and the examples from the sound recording industry.

Technology

The technology in Edison's business model is easily identifiable; at least at first view. For Edison, his business model begins with an invention - the phonograph. This is what is often referred to in the literature as a product technology. Technology can be understood as the usage and knowledge of tools, techniques, systems, methods of organisations or material products (c.f. Kremer 1993). As such, much of the innovation literature that concerns itself with the application of technology to organisational setting is focused around product technologies (see for example, O'Connor and Veryzer 2001; Stump et al. 2002). However this literature also encompasses three further but complementary perspectives on the use and value of technologies for organisational growth. These perspectives relate to process, core and infrastructure technologies.

Product and Process Technologies

Utterback and Abernathy (1975) identify the significance and differences between product and process innovation technologies. Product technologies provide stable configurations of physical things; understood as such by the provider (the firm) and the customer alike, for example, a phonograph or an iPod Classic. In contrast, process technologies can be understood as the organisational techniques that are used to buy components, make the product, and distribute them. Process technologies support a firm in carrying out the activities that constitute the product. Companies such as Flextronics offer process technologies to support OEM[1]s in the Electronic Manufacturing Services (EMS) sector, providing, *"enhanced design and engineering solutions that are vertically integrated with manufacturing, logistics, and component technologies to optimize customer operations by lowering costs and reducing time to market."* As such, process technologies often offer the benefits of the efficient co-ordination of activities across the business network.

[1] Original Equipment Manufacturers

Table 1: A Literature Review of the Elements of Business Models

	Business Model Element		
Author	Technology	Market Offering	Network Architecture
Chesbrough, Ahern, Finn & Guerraz (2006) (also see Chesbrough and Rosenbloom, 1998)	Successful deployments focused first on the design and implementation of the BM that commercialized the technology (p.49)	ApproTEC worked with IDEO...and its engineering team in Kenya to develop the design (p.49) [Simputer] failed to establish a connection between the product and value to consumers (p.50)	The BM took time and experimentation to make....owing to the differences in infrastructure of many developing countries (p.49) ApproTEC provided leadership and assistance to local entrepreneurs to build up a network of local companies that form the value network to deliver and sustain the product in the market (p50)
Doganova and Eyquem-Renault (2009)	the next section opens with ... the three technical artefacts upon which Koala's offer rests (a widget, a website and a GPS Smpartphone) (p.1564)	Other entities ...become its competitors - to whose "existing offer" Koala's product displays a series of advantages (p.1564)	The world thus sketched to be a coherent ensemble, a world inhabited by road infrastructure, drivers, GPS, navigation devices... the users of Koala's offer, widgets, websites and Smart-phones (p.1564)
(Zott and Amit 2007) (also see, Amit and Zott 2001)	Recent advances in communications and information technologies, such as the emergence and the swift expansion of the Internet, and the rapid decline in computing and communication costs, have accentuated the possibilities for the design of new boundary-spanning organizational forms.... these developments have opened new horizons for the design of business models by enabling firms to fundamentally change the way they organize and engage in economic exchanges.	Business Models maybe characterized by other value-creation themes. These could include lock-in designs, which attempt to retain stakeholders, and 'complementarities' designs, which emphasise the bundling of good, activities, resources or technologies.(p.182	The Business Model is a structural template that describes the organization of a focal firm's transactions with all of its external constituents in factor and product markets. (2001: p.511)
Pohle and Chapman (2006)	Global connectivity (created through telecommunications, IT Infrastructure and open standards) makes new skills and partners accessible and practical to employ and enables entirely new forms of collaboration, and thus new business models (p.37)	Four out of ten business model innovators thought it very likely that a competitor with a radically different business model would upset the competitive dynamics of the entire industry....if you have any doubts about the legitimacy of this fear ...just think about Eastman Kodak Company. It has been a wrenching process for the company to 'wean itself' from the traditional film business and solidify its footing in the digital arena. (p.36)	"They are assembling a business model fashioned from groups of 'specialized' capabilities - combining internal expertise and scale through shared services centres with the capabilities of specialised partners to create truly differentiating business designs" (p.39)

In their seminal paper, Utterback and Abernathy (1975) emphasis the shift in technology innovation over time from product to process innovation. The Apple iPod, for example is a clear product innovation technology and the revenue generated from this product technology will, at least in part, be dependent on reducing its cost-to-market through the use of process technologies. However, as Cusumano (2008) suggests, for some markets there may be a third stage that builds on this sequence. Cusumano's work, shows how after process innovation, software houses often innovate by integrating and selling services. In contrast, BM theory seems to suggest that there is no sequence to these different types of technological innovation; rather that these interact and influence each other. When Apple introduced the iPhone, managers did not wait until process innovations were exhausted before considering the network services and applications that might also form part of the market offing. Rather, as they began to understand more about what the market offering might be, process and service innovation where practiced simultaneously (John et al. 2009). Further, the iPhone was not a single product technology innovation but rather part of a family of alternative but similar offerings (see Figure 2), all of which consist of the same core technologies.

Core Technologies

The iPod itself represents a clever assembly of *core technologies* in an innovative way. Apple drew on the core technologies of integrated circuits, small LCD screens and long battery life to create a product that was light, versatile, user friendly and fun. Indeed, various configurations and assemblages of these particular core technologies are configured and offered for different customer groups; the iPod Shuffle (light, small, cheap); the iPod Classic (huge storage capacity; video and imaging capacity); and the iPhone (iPod with additional functionality such as phone calls, text, diary, video camera etc). Twiss (1992) recognises core technologies often dominate managerial practices and have a significant influence on what innovations the organisation identifies (also see, Chesbrough and Schwartz 2007; Teece 1987). But as with many technologies, the innovations associated with the iPod and iPhone, rely not just on the product, core and process technologies) but also the infrastructure technologies that support them.

Figure 2: The Technologies of an iPod Classic

Product Technology: the iPod; the iPhone; the Nano

Process Technology: design, build, ship, & reverse logistics integration

Core Technology: integrated circuits, small LCD screens, long life batteries

Infrastructure Technology: fast, pervasive, high capacity data storage and transmission systems

Infrastructure Technologies

The infrastructure technologies that makes the iPod and iPhone market offering work, are the very fast, pervasive, high capacity data storage and transmission systems resulting from bewildering increases in the capacity and capability of international digital communications and storage infrastructure and embodied in so-called 'cloud computing' (Metters and Verma 2008; Rappa 2004). Without this, the market practices of iTunes customers (purchasing and downloading digital music files, online) would not be possible. As has been shown, there is an hierarchical relationship between these forms of innovation, and a complex interplay between incremental innovation in underlying technologies on the one hand, and disruptive innovations in product form and concomitant market segmentation on the other.

As such, the underlying theory of the technology element of business models suggests four distinct dimensions to technology: product, process, core and infrastructure technology. What are the implications for the way managers practice the development of different dimensions of the technology element of the business model. Our analysis of the music industry suggests that all firms do not tend to innovate actively

themselves on all four dimensions of technology sequentially. Rather, we suggest that given the widespread use of contract manufacturing for electronic products, there is no reason to privilege process technology as any more central to a 'manufacturing' firm's own activities than say, core technologies (as Utterback and Abernathy suggest). Developers of personal computers work at least as closely with Intel (to access core technology) as with Flextronics (to access process technology). To a greater or lesser extent and depending on the specific case, core and infrastructural technologies should not be treated simply as 'environmental variables' but as part of the internal and external actors' that practice the business model (Birkinshaw et al. 2007; Birkinshaw et al. 2008).

Market Offering

For Edison, one of the biggest challenges was to work out what his market offering would be and as part of this, how customers might access this offering; through musical performances at fairs; in music parlours; or selling phonographs for home use. At first view, an important distinction in the market offering can be identified here. The musical performance at the fair and in the music parlour meant Edison (or his agents) provided a service. But selling the phonograph for home use meant selling a product. The way market offerings are described and delivered is something that has been much explored in the industrial marketing and economics product/service literature. Araujo and Spring (2006) suggest that the quest for foundational differences between products and services may be misguided as what counts as a product or a service is dependent on the nature of the producer-user interactions and the institutional structure of production (rather that any essential feature of a particular product or service). Callon (1991: 136) understands products as *'programs of action'* aimed at coordinating a network of distributed roles (also see, D'Adderio 2008). Such programs are thought to depend on the objects (products and artefacts) as well as the actors, their interactions and what they do and need. In keeping with these observations, we identify four dimensions to the market offerings that firms create; access, artefacts, activities and value.

Access

The form a market offering takes is affected by the Access that can be afforded. The entanglement of products and services in market offerings is a reflection of the technological changes and the advances in information and communications technologies that make any specific market offering possible. Look at the changes in market offerings from Edison's first venture with pay-per-tune for a one time experience to the iPod's pay-per-tune for a life time experience; the difference in the business model (and more specifically the way customers access and experience the market offering), lies in the technology available to deliver it. New ways of creating market offerings are generated because of the institutional structures created by such technologies that allow for the counting, valuing and paying for access to socio-technical capacities. Thus, instead of always owning a product, market offerings can be developed on the basis of access to products through renting, admission fees, or leasing agreements (Araujo and Spring 2006). In such cases, where a product is being accessed, the exchange may still involve an artefact.

Artefacts

When we download music to our iPod through iTunes, we buy a sound file, but we also get 'art' - an album sleeve (all be it in a digital format) - an artefact. In this way, market offering may include the bundling of an artefact that is the product (the sound file) and an artefact that is representative in some tangible way of the service being consumed (the album sleeve). Cusumano (2008) observes the shift in the software market from seeing software as a product, to seeing software as a service and the difficulties that this presented to companies in securing revenue streams from service offerings. To counter this software houses offered 'software in a box' - an artefact was created where it was not needed. The 'Box' represented an important physical link between the software company and its customer. This is consistent with Callon and Muniesa's (2005: 1233) comment that a service can be made more easily tradable by transforming it into a *'thing'*. For this reason, we argue that artefacts are an important dimension of the market offering.

Activities

Activities are concerned with what companies do for a customer as part of the market offering. In exploring the challenges of untangling product/service market offerings, Gadrey (2000) identifies the nature of service activities; what one economic unit (or firm) does for another, as part of the market offering. Thus, as Gadrey (2000: 375) explains,

> *"a service activity is an operation intended to bring about a change in the state in a reality C that is owned by the consumer B effected by provider A at the request of B in many cases in collaboration with him or her, but without leading to the production of a good that can circulate independently of medium C."* (original emphasis)

This is perhaps what we typically have in mind when we think about a 'service' - when someone does something for a customer. This may be, for example, a "*request for intervention*" (Hill 1977) or "*the provision of maintained technical capacities*" (Gadrey 2000). For the phonograph, activities might take the form of servicing, cleaning and maintaining the machine for the customer. For the iPod, this might take the form of the embodied activities in iTunes, which ensure a ready flow of old and contemporary digital music 'to your door'; and includes activities to support Genius - the software programme embedded in iTunes that recognises your musical taste by analysing your existing digital music collection and recommending new market offerings accordingly. Such activities may or may not be explicitly priced and exchanged in the way that a product might. Despite this observation, activities appear to remain an important dimension of the market offering element of business models and are thought to add significant value for customers (Vargo and Lusch 2004).

Value

Value can be defined as the benefits derived by a customer from an exchange. Anderson and Narus (1992) draw a distinction between the *value* a customer derives from using a product or service and the *price* put on that product/service at the point of exchange. They argue that in order to persuade customer to focus on total costs rather than simply on acquisition price (something that customers are invariably mindful of negotiation downwards), a supplier must have an accurate understanding of what its customers value (or might value in future). Narayandas (2005) points out that in industrial markets, different stakeholders within the purchasing organisations might derive different benefits or value from a single market offering. Understanding the value created by a market offering helps organisations understand markets and customer need and pricing decisions. Nokia did just this with the *'Comes With Music'* market offering. Nokia's mobile phone represented the technology element of the business model. The 'product' (the phone) is the technological element concerned with the stabilisation of some technological capability into a repeatable, reproducible embodiment. Whereas the 'Market Offering', - *'all you can eat'* digital music downloads; part of the mobile phone bundle - is concerned with how the product and associated activities are made available to the customer. What Nokia's managers did here was to work out what the economic system within which the firm was embedded might supply (the music suppliers) and demand (the teenage customers) and explore alternatives ways in which *artefacts*, *access* to capacities and service delivery *activities* can be combined to provide value – or, rather, opportunities for the co-production of value: 'innovative offerings can reconfigure co-productive patterns for higher value creation' (Normann 2001).

Network Architecture

When Edison and his distributors could not make money from his invention, they experimented to find new market for the phonograph. The distributors identified the potential of the recorded music market as more promising; compared with Dictaphone market. To make and shape the recorded music market, multiple actors had to interact and co-operate creating a new network architecture. Almost all of the business model literature gives a central place to the architecture of the business network. Several authors discuss the relationships between a focal firm and the organizations with which it transacts (Amit and Zott 2001; Mason

and Leek 2008). According to Zott and Amit (2008) "*the business model is a structural template that describes the organization of a focal firm's transactions with all of its external constituents in factor and product markets.*" Similarly, the business model concept is often defined in terms of transactions. For example, Amit and Zott (2005: 511) define business models as: "the structure, content and governance of transactions". Evolutionary economics generates some important theoretical insights here. From this literature we identify four important dimensions of network architecture: market standards, capabilities, transaction and relationships.

Markets and Standards

As markets evolve, standards emerge with them. In the recorded music market one of the principal stabilising factors of the industry was the standardisation of record players and records (standard record sizes were 7", 12" and others); each size had a standard playing speeds (78rpm, 45rpm and 33 1/3 rpm). Since the introduction of CDs and digital music, we are not even conscious of such industry standards as they operate without customer intervention. Langlois (2006) cites a similar evolutionary process within the grain industry in the 19th Century American Midwest. Such standards come about through lobbying and through power plays between key firms identifying and targeting specific markets. This has two important implications for business modelling. First, the standards recognised by firms, frame the way managers identify and pursue market opportunities. They are indicative of what might be traded and how, within any business network. Second, the notion of markets and standards might also help managers frame practices for market-making as they seek to influence and shape standards in a strategic move to influence which are adopted (Arthur 1989). Such market standards offer opportunities for firm to specialise. Organisations find ways to reduce what Langlois (2006) refers to as 'mundane transaction costs' (the costs that are a function of number of exchanges or volume of trade). In so doing, firms create and proliferate markets and standards. Markets and standards are one determinant of firm boundaries: another is what firms choose to specialise in.

Capabilities

Capabilities can be understood as the institutional specialist know-how that is retained, maintained and developed by an organisation over time. Edison's core capability lay in understanding the technologies. But for Apple, the core capabilities lie in understanding not only the iPod technologies but also how to access different capabilities from the wider business network. Kogut and Zander (1992) suggest that firms learn new skills and capabilities by recombining their current capabilities. They argue that new ways of cooperating cannot be easily acquired and as such growth occurs by building on the social relationships that currently exist. Hence, what a firm has done in the past tends to predict what it can do in the future. Two distinct type of capabilities are identified here; direct capabilities, those that relate to the core activities of the firm, and the firm's identity regarding what it does (Patel and Pavitt 2000); and indirect capabilities, those that relate to how a firm can access and utilize the core capabilities of others within the wider business network through the development and management of effective relationships (Araujo and Novello 2004; D'Adderio 2001; Mason and Leek 2008; Teece 2007). The accumulation of knowledge of the firm provides options to expand in new but uncertain markets in the future. The value of capabilities then, comes from a managers understanding and ability to access, assemble and reassemble different combinations of capabilities that reside not only within the boundaries of the firm, but also within the wider business network (Araujo et al. 2003). Langlois (2006: 1395) raises an important point here, observing,

> *"the designed systems we observe in the world are often precisely those that have found ways of evading the nonlinearities of complexity. They have done so by adopting a structure that is modular or to use [Herbert] Simon's more precise term, decomposable. All systems are 'modular' in this sense that they comprise parts, subsystems of parts and relations among parts and subsystems." (see, Simon 1962)*

Thus, as managers design network architectures, they develop frames for working with other organisations in ways that allow them to utilize their internal capabilities as well as the wider capabilities of the network;

Because each firm has its own network of supplier and customer relationships, the dynamic and evolutionary nature of business models clear here. This is concordant with Doganova and Eyquem-Renault (2009) recognition of needs to study business models in action (c.f. Latour 1987; Schatzki 2006) and that relationships influence how a firm's business model evolves.

Relationships

It was Edison's relationship with Jesse Lippincott that bought a significant change in the business model for the phonograph. Lippincott bought the patent and failing to make money from the phonograph as a Dictaphone, made money from the phonographs as a music player. This lead to further product technology innovations; through competition (with the American Gramophone Company) and collaborative (with Jesse Lippincott – who purchased the patent rights for the gramophone and the phonograph) the recorded music market was born. By 1890 Lippincott has good working relationships with his distributors and manufacturers and the music market was making money.

Relationships are a fundamental assumption of evolutionary economics (Dyer and Singh 1998; Nelson and Winter 1982). Similarly, business models are almost always inter-organisational from the outset. This is in contrast with firm-centric strategy, which too often considers the firm first and foremost, and networks of suppliers and collaborators as a secondary matter. For example: *"the BM is a structural template that describes the organization of a focal firm's transactions with all of its external constituents in factor and product markets."* (Zott and Amit 2007). But, as we saw from Edison's experience, it was his relationships with others in the network that possibilities of the music market were understood.

Where firms try to do new and innovative things, (developing product, process and infrastructure technologies for example), the relationships that support such innovations can cause the boundaries of the firm to appear less clear. Araujo, Dubois and Gadde (2003) draw on the work of Penrose (1959), Richardson (1972) and Loasby (1998) to explore the blurring of the boundaries between firms, claiming that when firms are able to develop close (sometimes embedded) working relationships with other firms in their business network, the nature of what the firm is may change; and what the firm might offer to the market might change too. Coase (1937: 388) considers why firms exist. He uses the example of the Lancashire cotton industry to make his point,

> *"a weaver can rent power and shop-room and can obtain looms and yarn on credit. This co-ordination of various factors of production is, however normally carried out without the intervention of the price mechanism."*

Why? Because transactions cost money and sometimes, as for our weaver, the advantages for multiple actors lie exponentially, in being able to co-ordinate resources without incurring the costs of the market.

More recently, Kogut and Zander (2003) have revisited the question of why firms exist. They argue that firms are better than markets at the sharing and transfer of the knowledge of individuals and groups. Such knowledge consists of information (who knows what) and of know-how (how to organize a research team). They argue that knowledge is held in multiple sites; by individuals, in practices and routines (by which members cooperate in a social communities; groups, organizations, and networks). In this way, Araujo et al. (2003) argue that the boundaries of the firm are determined by the interactions of a firm's direct and indirect capabilities. That is, firms benefit from relationships when they have both direct capabilities themselves (in the form of technologies for example, that can be combined and re-combined in innovative ways with the technologies of others in the network) but also the indirect capabilities (in the form of know-how to access and manage the capabilities of others distributed in the wider business network. Langlois (2006) argues that in order to understand the boundaries among firms, markets and hybrid forms of exchange over time, we need to have a more detailed knowledge of transactions.

Transactions

From 1870-1890 Edison made struggled to create a sustainable business model for his invention. In the end it was the 'local companies' that identified the potential of the music market – which generating profit for the manufactures (Edison), the patent holder (Lippincott) and the local companies that were directly servicing the market. As Afuah (2003) explains, *"Most firms are in business to make money, and business models are about making money"*. This is a more directly-expressed form of Seely Brown's 'architecture of the revenues'. The Business Model literature has always placed an emphasis on working out how to turn a capability or technological insight into profit. To do this, firm's need to transact. As Williamson (1885: 1) explains, a *"transaction occurs when a good or service is transferred across a technologically separable interface. One stage of activity terminates and another begins"*. Working out what the transactions costs are can be a challenge in its own right. Langlois (2006) draws on modularity theory to explain the life cycles of a specific type of transaction costs – '*mundane* transaction costs' (c.f. Baldwin 2008; Clark and Baldwin 2002). Mundane transactions costs represent the costs associated with buying from a market that are specifically attributable to the number of exchanges and volume of trade. Over time, as market standards emerge, the number and volume of trades increase and mundane transaction costs decrease. As Edison found out, when product innovation occurs, and standards do not exist, the costs associated with establishing standards (and markets) can be significant. Specifying mundane transaction costs help managers work out where specific activities begin and end; and who appropriates value from investments is such activities. Indeed, the focus of Langlois' (2002; 2006; 1999) work is to explicate how and where technologically separable interfaces come from, and why activities begin and end where they do? Langlois observes that where market standards are explicit and codified, firms need only interact through price (through thin, interfaces); where the market's standards are not explicit, thick interfaces (relationships) are needed. One final consideration then, is what makes a thin interface possible?

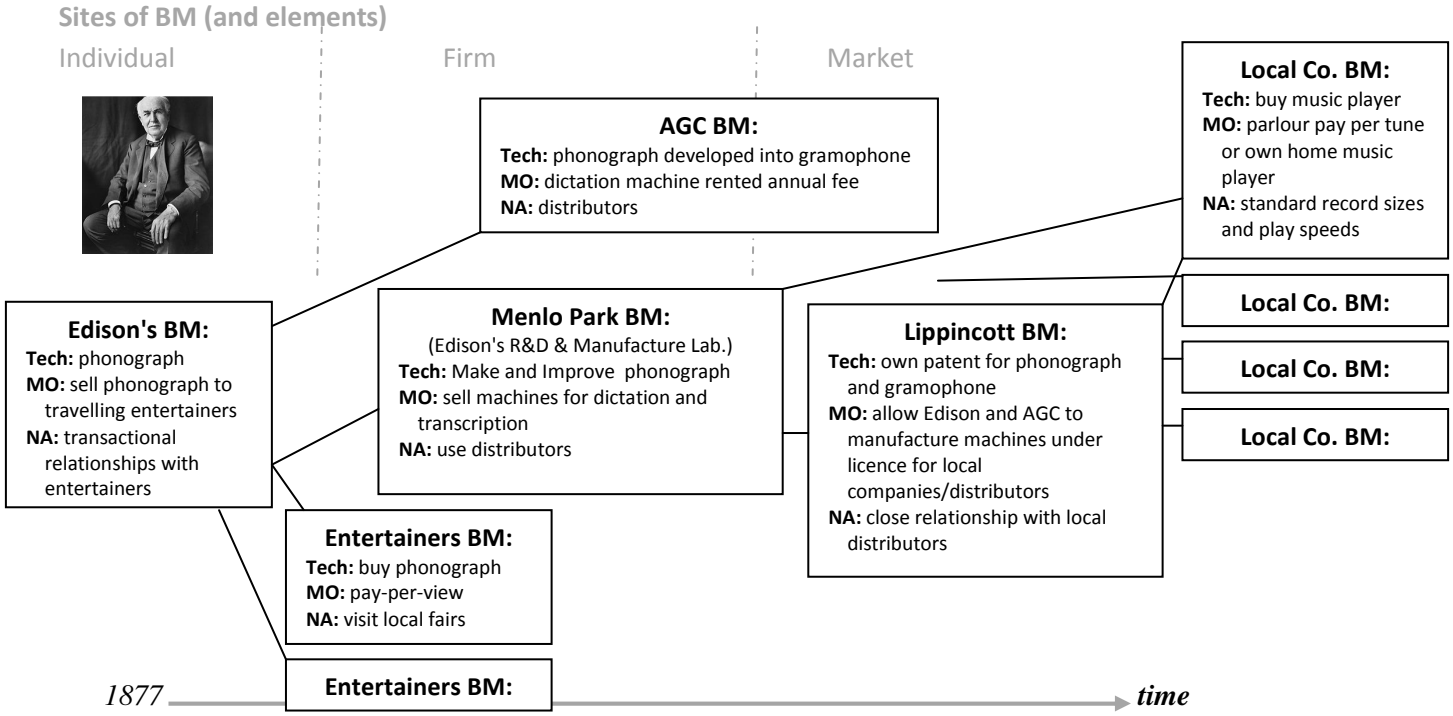
Zipkin (2006), provides the an example of how technologies can make transactions possible. In his paper, 'T*he best things is life were free'*, he explains how things that could not previously be made calculable and measureable (and thus could not be traded) can now sometimes be made as such precisely because of technological innovations (c.f. Azimont and Araujo 2007; Callon and Muniesa 2005). Zipkin (2006) cites the example of radio-frequency identification (RFID) technology being used to reduce the costs of transaction to both customers and providers, suggesting that such technologies might be applied to all products in supermarkets. Zipkin (2006) speculates about a future scenario which allows shoppers to fill their trolleys and exit the shop directly without going through a checkout. RFID tags would send data directly to the store and bank computers, negating the need for checkout staff and lowering transaction costs. Such technologies of transactions (and the mechanisms to support them) are some way off but such a scenario clearly illustrates the role of technologies in making markets work. Apple invested significant resources in developing the iTunes technology of transaction - to facilitate the trading of recorded music for their iPod and iPhone products. Thus, the notion of mundane transaction costs explains not only why firms need market standards in order to transact – but it also explains that, in the absence of market standards, firms need to form close relationships that allow them to co-ordinate and mediate activities in ways that, might allow for the creation and design of new markets and standards. In this way, transactions seem an important consideration in the business modelling process.

The Site of Business Models

The historical view of the recorded sound industry has allowed us to see change over time (see Figure 3). It allows us to *claim* the existence of 'a recorded sound industry'. When Edison set out, there was no recorded sound industry; and no recorded music market. Indeed, the notion of an industry isn't particularly helpful to us here (see, Bloch and Finch 2010) and is even avoided by some prominent researchers that seek to understand how ideas and their material artefacts make and shape markets. What is of interest is the

transformation of an idea into the business model of an individual, whose elements take on multiple sites until it forms a market.

Figure 3: The Multiplying Sites of Business Models in Early 19th Century Recorded Sound



Key:
BM: Business Model Tech: Technology
MO: Market Offering NA: Network Architecture

Edison has a technology that he transforms into a market offering (pay-per-view). At first he uses 'entertainers' as distributors to create a network architecture. This is his business model. He may have articulated this in the form of a material plan, ideas on the back of an envelope (Edison was known as a prolific note-taker) or the business model may purely have been an idea in Edison's head. We don't know. But what is clear, is that as soon as external actors (distributors) became involved in the practices of the business, the business model took instantiations in other sites - in that of the distributors - in so far as sharing an understanding of what the market might be - the Dictaphone/transcription market or the music market. In 1876 Edison opened a substantial research lab in Menlo Park, New Jersey. The Lab employed over a hundred people and this important resource allowed incremental technological development and production of his phonograph. When Edison started to run out of money he sold the Patent to Lippincott (who had also bought the gramophone patent from the AGC Company - a competing product). Lippincott bought all the patent for the competing technologies. His network architecture allowed him to spot act on the observations of the 'local companies' that the music market represented a bigger market opportunity than the Dictaphones and transcription market. Lippincott as had enough control of the market to introduce of market standards.

What we see in Figure 3 (all be it simplistically), is the way different actors make and shape the business model at different times; and as such, how some elements of the business model remain stable but move into different constellations; in different (and multiple) sites, to form markets. Thus, different actors have more or less influence on the business model and the market at different times. Through this observation it seems that a business models (and their elements) have multiple (and *multiplying*) sites over time (c.f. Schatzki 2005).

Though the linearity implied by Figure 3. must be regarded with extreme caution, the historical analysis gives us some clues to as to how business models happen.

Business Models as they Happen

Business models can be understood as a framing device for influencing and shaping collective and individual action. Morris et al. (2005) identify three distinct levels at which business models happen; (i) the strategic level - where individuals share ideas about what they think the firm should achieve, (ii) operational level - how the different actors might go about making the organisational goals happen, and (iii) the level of individual transactions or economic exchanges - what the business model means for the actions of individuals dealing with any specific exchange. The theory of social practices helps us understand the interconnectedness of these multiple levels. The connectivity between actors (with bodies that perform activities and minds that shape performances), agency (the power they have to shape action), knowledge and understanding (what actors think they should do) can be understood as the practices that form structures of action. Consequently, we argue that business models might also usefully be understood as bundles of practices and that institutionalised in the performance of actors as individuals, in firms and in markets; across multiple sites over time (c.f. Schatzki 2006; Schatzki 2005).

Practice theory is a purpose oriented theory of action (c.f. Latour 2005). Reckwitz (2002: 249) defines a practice as *"a routinized type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge."* These practices are then translated into performances (what people actually do, with what, whom, when and how). Thus, practices form structures of action in the same way that elaborated business models do (c.f. Doganova and Eyquem-Renault 2009). What is particularly insightful and helpful in building an understanding of the emergent business model literature through a practice theory lens, is the notion that not only do practices link what people think with the way they act, (and with what, whom and where) but also that practices are by nature routinized types of behaviour which consist of several interconnected elements. This helps us see how practices help firms understand and perform the business model process. We see such observations widely reported (though not explicitly labelled as 'practice') in much of the literature that comes from the different disciplinary streams discussed in the Business Model Elements section. For example, in the Market Offering section, we cite D'Adderio's (2008) work, which describes the interactions between action and organisational rules captured in a firms standard operating procedure. D'Adderio describes an 'engineering freeze' stage of a product development process at a leading automotive manufacturer. The process (and the associated practices) spanned *"across most organisational functions (industrial design, product engineering, analysis, testing, production, manufacturing, accountancy) and levels (designers, shop floor technicians, project and programme managers)."* (D'Adderio 2008: 771). The business modelling process is a messy business, and it is precisely because the associated, boundary spanning practices interconnect, that business models iteratively influence, shape and are shaped by the market as it happens (c.f. Schatzki 2006).

D'Adderio (2008) observes that processes are often codified through rules, is worthy of further consideration. Rules are sometimes embedded in artefacts that act as framing devices. These framing devices make, shape and evolve the practices and routines through iterative cycles of action, interaction and reframing. Here we see parallels between the routines and business model literature, in that routines are understood to be both 'ostensive' and 'performative' in nature (Feldman and Pentland 2003). As D'adderio explains, the 'ostensive' or 'rules-to-be-interpreted' nature of routines is often captured and represented in artefacts such as SOPs[2] or, as we argue, perhaps business models. The 'performative' nature of routines is concerned with the specific actions, by specific people, at specific times and places, that bring the routines to life; the translation of the 'rule' into practice. Seen as a bundle of practices, business models can be understood as generative and continuously emerging systems, characterised by structure and dynamics. In this way, the artefacts that capture the business model (through strategic plans, PowerPoint presentations and targets) can be understood

[2] Standard Operating Procedures

to have agency in framing the way the business (and by implication the market) is developed and grown (Doganova and Eyquem-Renault 2009).

The point then, is that models (and more specifically business models) are important to the institutions within which they are embedded. Callon's and MacKenzie's observe that models are an intrinsic part of markets (rather than being external to them), has leading implications for business model theory;

> *"in fact there is no real separation between 'market models' on one side and 'market practices' on the other: market models are performed in practice. Models form a crucial part of markets; they are not purely detached external representations or virtual abstractions (cf. Miller, 1998 in Holm 2002) but engines that make the markets tick."* (D'Adderio 2008: 775).

Business models are not just a description of something that rests outside of the business but are a constituent part of it. Further, as the business itself is embedded in a market, business models need to be understood as constituent parts markets too (Callon 1998; Callon et al. 2007; MacKenzie 2006; MacKenzie and Millo 2003 ; Schatzki 2005).

Business models can provide a shared understanding of routinized action as embedded in collective cognitive and symbolic structures of shared knowledge. Business models enable a socially shared way of ascribing meaning to the world. They explicate the practices that constitute the activities of the business - iteratively shaping and being shaped by emerging markets.

Conclusions and Implications

This paper set out to explore the practice of business models. The paper offers three key contributions. First, it presents an original business model framework through theoretical synthesis that identifies what business models are. Drawing together concepts from technology and innovation studies (1986), industrial marketing, operations and service strategy (Hayes 2002; Hayes 2008; Normann 2001), and evolutionary economics (Baldwin 2008; Langlois 2006) the paper provides a much deeper understanding of what business models are and how they are theorised. The underlying theory of the three business model elements explicates multiple dimensions of each element and the connections between them. The framework was tested and improved using secondary case examples from the recorded sound industry. In this way, business model theory stands to contribute to management practice by offering a framework that, when populated by managers may help mangers frame purpose oriented action (Latour 2005). Business models may adopt multiple manifestations in the form of PowerPoint presentations, strategy documents or targets used for directing action of the business and even the businesses of their collaborative partners, within any given market context.

Second, the business model framework presented here offers as an analytical framework through which managers can seek to make sense of and share understanding between individuals, groups and organisations of what the situation is in order to 'work out' what is to be done. Such framing of action is consistent with understanding, not only what business models are, but what they do. That is, how they become embedded in markets; becoming a constituent part of what the market and what the firm is and does. This recognising that the *'doing'* of business models is dependent on interactions with others in the market-place (Håkansson 1982) and that the types of practices and spaces that form markets (and the models that describe them) are likely to be contingent, and context specific (Araujo, 2007). We find considerable benefit in using the framework, to understand how managers *'do'* business models in ways that balances change and stability; innovation and risk. The model is flexible in the sense that, being non-sequential, analysis can begin in any element or elements, depending on current concerns or opportunities. It also seems that there is considerable path dependence in the susceptibility of the various elements to innovation, as well as unanticipated dynamic

interconnections between elements. In this way, business models are understood to have multiplying sites over time (Schatzki 2005).

Third, by understanding business models as a framing device for action, we explore the dynamic nature of business models as well as attributing agency to them; positioning them as a constituent part of any business that iteratively influences and is influenced by firm, inter-firm and market practices. In this sense, business models might be understood as bundles of interconnecting practices that evolve with the context within which they are practices - but that in turn influence and shape the context. Thus, changes in technology practices are likely to lead to changes in network architecture and so on. In this way, the business model framework identifies different types of management practices that drive the development of business models in manufacturing and service settings; technology practices; market offering practices and network architecture practices. But, in the process of business these practices interconnect and enable the business to operate as a whole. And that, these practices shape the markets within which the firm is embedded.

References

Afuah, A. (2003), Business models : a strategic management approach. Boston and London: McGraw-Hill/Irwin.

Amit, Raphael and Christoph Zott (2001), "Value Creation in E-Business," Strategic Management Journal, 22 (6/7), 493.

Anderson, James C and James A Narus (1992), "Business Marketing: Understand What Customers Value," Harvard Business Review, 76 (6), 53-65.

Anonymous (2008), "Cross-subsidised subscriptions offer a promising new model-if the sums add up," Economist, October 2nd.

Araujo, Luis, Anna Dubois, and Lars-Erik Gadde (2003), "The Multiple Boundaries of the Firm," Journal of Management Studies, 40 (5), 1255-77.

Araujo, Luis and Simone Novello (2004), "Sticky Knowledge: Barriers to Knowing in the Firm," Management Learning, 35 (1), 90.

Araujo, Luis and Martin Spring (2006), "Services, products, and the institutional structure of production," Industrial Marketing Management, 35 (7), 797-805.

Arthur, W. Brian (1989), "Competing technologies, increasing returns, and lock-in by historical events
" Economic Journal, 99, 116-31.

Azimont, Frank and Luis Araujo (2007), "Category reviews as market-shaping events," Industrial Marketing Management, 36 (7), 849-60.

Baldwin, C. Y. (2008), "Where do transactions come from? Modularity, transactions, and the boundaries of firms," Industrial and Corporate Change, 17 (1), 155-95.

Bellman, R. and C. Clark (1957), "On the construction of a multi-stage, multi-person business game," Operations Research, 5 (4), 469-503.

Birkinshaw, Julian, John Bessant, and Rick Delbridge (2007), "Finding, Forming, and Performing: Creating Networks for Discontinuous Innovation," California Management Review, 49, 67-83.

Birkinshaw, Julian, Gary Hamel, and Michael J. Mol (2008), "Management Innovation," Academy of Management Review, 33 (4), 825-45.

Bloch, Harry and John Finch (2010), "Firms and industries in evolutionary economics: lessons from Marshall, Young, Steindl and Penrose," Journal of Evolutionary Economics, 20, 139-62.

Callon, M. (1998), 'Introduction: The Embeddedness of Economic Markets in Economics' in The Laws of the Markets. Oxford: Basil Blackwell.

---- Ed. (1991), Techno-economic networks and irreversibility. London: Routledge.

Callon, M., Y. Millo, and F. Muniesa (2007), Market Devices. Oxford: Basil Blackwell.

Callon, M. and F. Muniesa (2005), "Peripheral Vision: Economic Markets as Calculative Collective Devices," Organisation Studies, 26 (8), 1229-50.

Chandler, Alfred (1969), "The structure of American Industry in the Twentieth Centrury: A Historical Overview," Business History Review, 43, 255-81.

Chesbrough, H. and R. S. Rosenbloom (2002), "The role of the business model in capturing value from innovation: evidence from Xerox Corporation's Technology Spin-off Companies," Industrial & Corporate Change, 11, 529-55.

Chesbrough, Henry and Kevin Schwartz (2007), "Innovating business models with co-development partnerships," Research Technology Management, 50 (1), 55-59.

Clark, Kim B. and Carliss Y. Baldwin (2002), "Where Do Transactions Come from? A Perspective from Engineering Design," Harvard NOM

Coase, R H (1937), "The Nature of the Firm," Economica, 4 (16), 386-405.

Cusumano, M.A. (2008), "Changing software business: Moving from products to services," Computer, 41 (1), 20-27.

D'Adderio, Luciana (2001), "Crafting the virtual prototype: how firms integrate knowledge and capabilities across organisational boundaries," Research Policy, 30 (9), 1409-24.

---- (2008), "The performativity of routines: Theorising the influence of artefacts and distributed agencies on routines dynamics," Research Policy, 37 (5), 769-89.

de Geus, Arie P. (1988), "Planning as Learning," Harvard Business Review, 66 (2), 70-74.

Doganova, Liliana and Marie Eyquem-Renault (2009), "What do business models do?: Innovation devices in technology entrepreneurship," Research Policy, 38 (10), 1559-70.

Dowd, T. (2002), "Culture and commodification: technology and structural power in the early US recording industry," International Journal of Sociology and Social Policy, 22 (1-3), 106-40.

Dyer, Jeffrey H and Harbir Singh (1998), "The relational view: Cooperative strategy and sources of interorganizational competitive advantage," Academy of Management. The Academy of Management Review, 23 (4), 660.

Edmondson, Amy C. and Ingrid M. Nembhard (2009), "Product Development and Learning in Project Teams: The Challenges Are the Benefits," Journal of Product Innovation Management, 26 (2), 123-38.

Feldman, M. S. and B. T. Pentland (2003), "Reconceptualizing organisational routines as a source of flexibility and change," Administrative Science Quarterly, 48, 94-118.

Gadrey, Jean (2000), "The characterization of goods and services: an alternative approach
" Review of Income & Wealth, 46 (3), 369-87.

Hayes, R. H. (2002), "Challenges posed to operations management by the "new economy"," Production and Operations Management, 11 (1), 21-32.

Hayes, Robert H. (2008), "Operations Management's Next Source of Galvanizing Energy?," Production and Operations Management, 17 (6), 567-72.

Hill, Peter (1977), "On goods and services," Review of Income and Wealth, 23 (4), 315-38.

Holm, P. (2002), "Which way is up on Callon? A Review of a Review: Daniel Mill's Turning Callon the Right Way Up," Norwegian College of Fishery Science, Tromso (Norway).

John, D., F. Nightingale, and A. Syed (2009), "Apple - The Most Admired Brand," IBS Research Center, ecch.

Kogut, B. and U. Zander (2003), "Knowledge of the firm and the evolutionary theory of the multinational corporation," Journal of International Business Studies, 34, 516-29.

Kogut, Bruce and Udo Zander (1992), "Knowledge of the firm, Combinative Capabilities and the Replication of Technology," Organization Science, 3 (3), 383-97.

Kremer, Michael (1993), "Population growth and technological change: One million B.C. to 1990," in Quarterly Journal of Economics Vol. 108: MIT Press.

Langlois, Richard N. (2002), "Modularity in technology and organization," Journal of Economic Behavior & Organization, 49 (1), 19.

---- (2006), "The Secret Life of Mundane Transaction Costs," Organization Studies (01708406), 27 (9), 1389-410.

---- (1999), "Technological Standards, Innovation, and Essential Facilities," in Working Papers -- Yale School of Management's Economics Research Network.

Latour, B. (2005), Reassembling the Social. An Introduction to Actor-Network Theory. Oxford: Oxford University Press.

Latour, Bruno (1987), Science in Action. Cambridge, Massachusetts: Harvard University Press.

Linder, J. C. and S. Cantrell (2000), Changing Business Models. Chicago: Accenture.

Loasby, B. J. (1998), "The organization of capabilities," Journal of Economic Behavior and Organization, 35, 139-60.

MacKenzie, Donald (2006), "Is economics performative? Option theory and the construction of derivatives markets," Journal of the History of Economic Thought, 28 (1), 29-55.

MacKenzie, Donald and Yuval Millo (2003), "Constructing a Market, Performing Theory: The Historical Sociology of a Financial Derivatives Exchange1," The American Journal of Sociology, 109 (1), 107-45.

Magretta, J. (2002), "Why business models matter," Harvard Business Review, 80 (5), 86-92.

Mahadevan, B. (2000), "Business Models for Internet-Based E-Commerce: An Anatomy," California Management Review, 42 (4), 55-69.

Mason, K. and S. Leek (2008), "Learning to build a supply network: An exploration of dynamic business models," Journal of Management Studies, 45 (4), 774-99.

Metters, Richard and Rohit Verma (2008), "History of offshoring knowledge services," Journal of Operations Management, 26, 141-47.

Miller, Roger, Xavier Olleros, and Luis Molinie (2008), "Innovation Games: A New Approach to the Competitive Challenge," Long Range Planning, 41 (4), 378-94.

Mintzberg, H. and J. R. Gosling (2002), "Reality programming for MBAs," Strategy and Business, 26 (1), 28-31.

Morris, Michael, Minet Schindehutte, and Jeffrey Allen (2005), "The entrepreneur's business model: toward a unified perspective," Journal of Business Research, 58 (6), 726.

Narayandas, Das (2005), "Building Loyalty in Business Markets," Harvard Business Review, 83 (9), 131-39.

Nelson, R. R. and S. G. Winter (1982), An Evolutionary Theory of Economic Change. Cambridge, M.A.: Belknap.

Normann, R. (2001), Reframing business: when the map changes the landscape. Chichester: John Wiley.

O'Connor, Gina Colarelli and Robert W. Veryzer (2001), "The nature of market visioning for technology-based radical innovation," Journal of Product Innovation Management, 18 (4), 231-46.

Osterwalder, A., Y. Pigneur, and C. L. Tucci (2005), "Clarifying business models: origins, present and future of the concept," Communications of the Association for Information Systems (15), 2-40.

Patel, Pari and Keith Pavitt (2000), "How technological competencies define the core (not the boundaries) of the firm," in *The Nature and Dynamics of Organizational Capabilities*, Giovanni Dosi and Richard R. Nelson and Sidney G Winter, eds. Oxford: OUP.

Penrose, Edith (1959), The theory of the growth of the firm. Oxford: Oxford University Press.

Pfeffer, J and R Sutton (2000), The knowing-doing gap: How smart companies talk into action. Cambridge, Massachusetts: Harvard Business School Press.

Pfeffer, Jeffrey and Christina T. Fong (2002), "The End of Business Schools? Less Success Than Meets the Eye," Academy of Management Learning & Education, 1 (1), 78-95.

Pohle, G. and M. Chapman (2006), "IBM's global CEO report 2006: business model innovation matters," Strategy and Leadership, 34 (5), 34-40.

Rappa, M.A. (2004), "The utility business model and the future of computing services," IBM Systems Journal, 43 (1), 32-42.

Reckwitz, Andreas (2002), "Toward a Theory of Social Practices: A Development in Culturalist Theorizing," European Journal of Social Theory, 5 (2), 243-63.

Richardson, G. B. (1972), "The Organisation of Industry," Economic Journal, 82.

Schatzki, Theodore R. (2006), "On Organizations as they Happen," Organization Studies, 27 (12), 1863-73.

---- (2005), "Peripheral Vision: The Sites of Organizations," Organization Studies, 26 (3), 465-84.

Schweizer, Lars (2005), "Concept and evolution of business models," Journal of General Management, 31 (2), 37-56.

Simon, Herbert A. (1962), "The architecture of complexity," Proceedings of the American Philosophical Society, 106, 467-82.

Stump, Rodney L., Gerard A. Athaide, and Ashwin W. Joshi (2002), "Managing seller-buyer new product development relationships for customized products: a contingency model based on transaction cost analysis and empirical test," Journal of Product Innovation Management, 19 (6), 439-54.

Teece, D. J. (1987), The Competitive Challenge: Strategy for industrial Innovation and Renewal: Ballinger.

Teece, David J. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance," Strategic Management Journal 28 (13), 1319-50.

Timmers, P. (1999), Electronic Commerce. Chichester: John Wiley.

Tushman, Michael L. and Philip Anderson (1986), "Technological Discontinuities and Organizational Environments," Administrative Science Quarterly, 31 (3), 439-65.

Twiss, Brian (1992), Managing Technological innovation (4th ed.). London: Pitman Publishing.

Vargo, Stephen L. and Robert F. Lusch (2004), "Evolving to a New Dominant Logic for Marketing," Journal of Marketing, 68, 1-17.

Weill, P. and M. Vitale (2001), Place to Space: Moving to eBusiness Models. Boston: Harvard Business School Publishing Corporation,.

Yip, George (2004), "Using strategy to change your business model," Business Strategy Review, 15 (2), 18-24.

Zipkin, Paul (2006), "OM ForumThe Best Things in Life Were Free: On the Technology of Transactions," Manufacturing & Service Operations Management, 8 (4), 321-29.

Zott, Christoph and Raphael Amit (2007), "The fit between product market strategy and business model: implications for firm performance," Strategic Management Journal, 29 (1), 1-26.