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Reciprocating business model innovation – how client and supplier models interact
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Abstract

Purpose

The purpose of this article is to show the relationship between changes of industry business model on the supplier side and changes in business model on the client side, using the information technology industry as an example. This is the first paper to investigate supplier-side industry-wide business models and identify their consequences for client-side industry-wide business models.

Methodology

The methodology is a review of academic and grey literature and conceptual analysis, applied particularly to three client-side industry case studies – financial services, airlines and online video streaming services

Findings

Changes in the business model on the client side may be contingent on the products and services that emerge from the information and communications technology industry as it changes its business models.

Practical implications

Client-side companies formulating their business strategies in industries which are highly dependent on successful information management should factor developments in the information and communications technology industry business models into account in their planning. They should also consider how they can influence business model change on the supplier side by changes they make to their information management strategies and processes.

Research implications

The implications for research are that researching investigating changes in business models, particularly in relation to clients of the IT industry, should consider whether there have been changes in business models on the supplier or client side, and whether and how they have interacted.

Word count

11201 words

Keywords

Business models, innovation cycles, information and communications technology, client-supplier relationships.

Introduction and objectives

Most definitions of business model focus on the individual organisation and its value creation and value offerings, or of the ecosystem associated with a particular supplier over a short period, rather than models of a whole industry and how they evolve, though some focus on higher level models (e.g. the subscription business model) as they apply across many companies or indeed several industries (Lambert and Davidson, 2013). However, some research has been carried out on the evolution of network business models. This is summarised well in Jucevski *et al.* (2020). They identify that, particularly for business models that are contingent upon information and communication systems, it is more appropriate to consider the evolution of the business model(s) of the relevant ecosystem. The main focus of their work is development of interlocking business models in relation to information and communication technology (ICT) suppliers, though they include the supplier-client relationship which is the subject of this article. The latter topic – particularly the broadening of actors from the individual firm to a market network of users, partners and other actors in a service ecosystem, has been explored by others in relation to multisided platform development, in particular by Harmon and Castro-Leon (2018). However, as this article shows, the concept of reciprocating business models can add value to this discussion, partly through its view of the temporal sequence of interactions.

This article examines how the evolving business models of the whole ICT industry, as represented by the changes made in many firms, including external networks of partners and suppliers, affect how business models evolve on the client side, and how this affects the marketing of the former and the buying of the latter. It examines the history of business models in the ICT industry and of business models in three industries - direct insurance, airlines, streaming video, and uses the emergence of new competitors to identify how the changing model of the ICT industry allowed new entrants to emerge using new business models,

working closely with their ICT providers. To understand how this evolution of business models on either side of the market takes place, a brief history of the ICT industry is presented, along with the histories of the three sectors, so that the distinctiveness of each business model can be understood.

Many business model definitions have a value or customer or market-oriented approach, making them particularly valuable for industrial marketing analysis (Osterwalder *et al.*, 2005). Osterwalder and Pigneur's (2010) Business Model Canvas identifies four main areas - product, customer, infrastructure and finance, developed into nine components - key partners, cost structure, key activities, key resources, value proposition, customer relationships, customer segments, channels and revenue streams. The canvas includes finding new ways to create value for customers and of leveraging external networks, (Prahalad and Krishnan, 2008; Chesbrough, 2006; Mason and Mouzas, 2012; Amit and Zott, 2001; Parnell *et al.*, 2018).

A major new factor in ICT decisions has been that the locus of control has shifted and continues to shift as new technologies such as blockchain facilitate decentralization while mitigating the associated security risks (Chen *et al.*, 2020). Where enterprise decisions were typically initiated by the IT department, and to some extent along business group lines, the push-model (from the vendor, to the enterprise, to the end-user) became difficult to sustain. A ruthless focus on the user experience by companies such as Apple demonstrated that technology did not need to be difficult to understand, use, or integrate into a work-life paradigm (Bergman *et al.*, 2020). What started out as a set of technical capabilities delivered more functionality, and an attractive overall price point, that also created opportunities for innovation, integration, and new solutions. A customer insistence on a simplified experience led to a relaxation of "bring your own device" policies in workplaces, which effectively reversed how the IT function and business worked together (Zhang *et al.* 2019).

The widespread use of concept of "business model" has been prompted partly by firms using disruptive web-based models that destabilized industries and markets, often using two sided platforms that bring together customers and suppliers, with the platform owner marketing to both the businesses on one side of the platform and the customers (who may be businesses or final consumers) on the other (Stone *et al.*, 2017b). Web-based businesses acting as aggregators perform the same function – aggregating demand from consumers and businesses and supply from businesses (increasingly from consumers). Their business models may include much smarter management of logistics and supply chains (including manufacturing), accelerating them, making them more cost-effective and able to handle a greater variety of goods and services, and more varied order sizes and production runs (Stott *et al.*, 2016).

Research propositions and concepts

The central research proposition proposed in this article is that in business to business markets, the evolution of business models on the client side is partly determined by the evolution of business models on the supplier side. In this case, the suppliers supply information and communications technologies and the users are firms using those technologies. To understand this process, it is necessary to understand how the suppliers' business models evolve and the processes by which their models affect the business models of the client side.

How business models evolve

Business models evolve and mature (McGrath, 2010), as we see through our case studies. The business model concept gives strategists new ways to assess strategic choices. In some cases, model designs can be piloted. Spin-off companies can be used to test new models before changing the parent's business model (McGrath, 2010). This process has been particularly evident in financial services (Nichkassova and Shmarlouskaya, 2020). For Prahalad and Krishnan (2008), the focus of value creation shifts from customer experience from product and service, via understanding customers' needs, behaviors and skills. In business to business markets particularly, co-creation can take place. This co-creation to create new value propositions is demonstrated in our case studies and is underpinned by the process of solution selling and marketing, described later in this article. This process has been very well demonstrated in the case of Salesforce.com, providers of CRM cloud-based software (Stone *et al.*, 2020). However, there needs to be balance exploration of new capabilities to create new models and exploitation of these new capabilities to optimize existing models (O'Reilly and Tushman, 2013; Gibson and Brinkshaw, 2004). There also needs to be a balance between meeting the needs of existing customers while developing solutions that might appeal to new customers (Gibson and Brinkshaw, 2004; O'Reilly and Tushman, 2004). Accessing resource from partner networks may be a critical part of this flexibility (Mason and Mouzas, 2012).

Creation of relationships and value

Value is created by business models and value chain structure (Afuah, 2003; Zott and Amit, 2010; Chesbrough, 2006; MacLennan, 2011; Chesbrough and Rosenbloom, 2000). In this, customer insights are critical to model design. They can guide value proposition design, help identify whether existing or new distribution channels are appropriate, identify ways of advancing or reducing deficiencies in customer relationship management, and identify and plan to capitalise on new revenue streams (Osterwalder and Pigneur, 2010). For large customers, the consultative or solution-selling approach therefore includes an important element of data gathering (Cerasale and Stone, 2004). Understanding the customer and what they value is key (Porter and Millar, 1985). The business model concept focuses partly on customer value creation (Osterwalder *et al.*, 2005; Seddon and Lewis, 2003; Prahalad and Krishnan, 2008). Revenue model and pricing strategy determine how much value can be captured. The more capacity, capabilities and partners a firm has, the greater the share of the value it creates that it can retain (Zott and Amit, 2010). This is most visible in the case of Apple, which retains a much higher share of the value created by its

iPhone/iPad/iTunes model than Samsung, which achieves a lower net price per device than Apple and has to share it with partners such as Google, for its Android operating system.

Technological push versus demand pull, or co-creation and mutual solutions development

The information technology industry has evolved as a result of close interaction between suppliers and clients, and it can be argued that in the case of business to business clients, this interaction has become increasingly close. However, since research into this area was initiated in the 1960s, it was always clear that close user involvement was a key to success in technological innovation (Rothwell and Teubal, 1977). So, it can be argued that the debate about whether innovations were one or the other (von Hippel, 1976, Freeman, 1974, Rosenberg, 1982) is largely sterile, at least in the business to business context, with a balance of technological push and demand pull always being the norm, and the exceptions being at the extremes. This debate relates to innovations, not inventions. The literature abounds with examples of scientists and technologists producing ideas with no apparent immediate application, and then someone (supplier or client) identifying a market for them -hence the famous discovery by Steve Jobs of Apple of the "Gorilla glass" (very thin and strong glass) produced by Corning and applying it to smartphone screens (Isaacson, 2012).

The nature of relationships between suppliers and clients, based on the evolving idea of solutions rather than products, meant that the need for close relationships was increasingly well understood as the industry evolved. Also, whatever the first step (e.g. an idea in a development laboratory, an expression of need by a large client), subsequent steps of development, testing and modification normally draw client and supplier closely together. This tendency has been increased by supplier approaches involving stakeholder management and design thinking, which necessarily bring demand and supply sides closer together (Brem and Voigt, 2009).

Many information technology innovations industry are not the result of a simple dyad - an information technology supplier working with a non-information technology client, but result from two companies - a client and a supplier. Thus, Dell is a client for Intel processors and for Microsoft software (Kraemer *et al.*, 200). Each company has several other relationships, e.g. Microsoft with end users and other software companies whose software runs on Windows, Intel with computer hardware companies who use its processors as well as software companies, the functioning of whose products depends on Intel's processors, Dell with companies that supply it with components and software, as well as with clients.

Our Netflix case study shows how advanced users push the frontiers of software development and platform providers (Cuatrecasas, 2019). One of its main systems suppliers, Amazon, was initially a client via Amazon Web Services, as Amazon changed its business model. American Airlines became a supplier through its Sabre Global Distribution System. Sometimes the relationship starts with modification of systems for a client's own purposes. For example, EasyJet works with drone suppliers to develop drones for aircraft maintenance inspection (Easyjet, 2020a). This process can also apply with smaller firms – hence the idea of user-entrepreneurs (Chandra and Coviello, 2010). The availability of capital to allow users to become suppliers is an established phenomenon (Lakhani and Von Hippel, 2003, Shah and Tripsas, 2007).

The relationship between suppliers and clients is not one way. Although information technology evolved rapidly, pressure from clients was often critical in pushing suppliers to find new ways of developing and implementing systems. Demand pull is often as important as technology or supply push. These issues were explored in relation to the information technology industry by Van den Ende and Dolfsma (2005) creating, who conclude that the demand-side role is more than selection between competing paradigms, with customers sometimes creating new paradigms, as seen in all our case studies. This can also be seen in relationships between computer manufacturers (the clients) and manufacturers of random-access memories (Kim and Lee, 2009). Knowledge flows are critical in this process (Antonelli and Gehringer, 2019) - one reason for the critical importance of solutions sales people, whose role includes identifying what large and/or highly innovative customers need and working with experts in their own companies to modify what is offered to meet these needs.

So, the industry is increasingly characterized by co-creation, itself only possible because of the diffusion of expertise, initially mainly from suppliers to clients, but now universal. The idea of users as innovators is not, as some claim, equivalent to demand-side innovation (Baldwin and Von Hippel, 2010, Priem *et al.*, 2012), but more akin to demand-side becoming supply-side as their business models change. One study shows that some technology-push start-ups change to a market-pull orientation because of changing priorities, new market information or new partners, while others begin with a market-pull orientation and move to technology-push because market experiences identify a need to improve processes and productivity or to meet partner specifications or demand for complementary products (Lubik *et al.*, 2011).

The rapid diffusion of ICT may indicate pent-up or latent demand i.e. demand that existed, but this does not constitute demand pull in the sense usually articulated. (van den Ende and Dolfsma, 2005, Godin and Lane, 2013). So, although there may always be examples of pure demand-side or supply-side innovation, perhaps as disruptive technologies offered by suppliers or disruptive client business models requiring radically new technologies, neither is the main model by which the ICT industry is evolving. Symbiotic development, involving leading-edge customers and leading-edge suppliers, is common. This is confirmed by a recent study of recent developments in information technology, autonomous cars and intelligent robots, confirming the dynamic nature of feedback between technology, business model and market and the importance of regulation, standards and the role of the leading firm (Yun *et al.*, 2016). However, the opposite may occur. Rather than classic vertical integrations and

diversifications, platform suppliers have invaded their clients' markets, taking over some of their functions and in extreme cases destroying their business models e.g. Google's invasion of the advertising marketing, displacing other channels.

The evolution of business models in the information and communications technology industries

As identified by Stone *et al.* (2020a), the ICT industry evolves in cycles, starting with a new model, which increases its market coverage and may become dominated by a few large firms, but is then challenged by a new model, while costs for customers using older models falls as it becomes commoditized. Client-side models also change, in some cases incentivized by a fall in prices as older models become commoditized. In the ICT industry, several generic business models have been identified (Stabell and Fjeldstad, 1998). An updated list would include (Stone *et al.*, 2020a):

- Value chains
- Platform providers; social, media and related services providers
- Software and services subscription models,
- Solution shops
- Facilitated user networks, such as in telecommunications, where the network supports business users

Stone *et al.* (2020), identified the following main ICT industry business models over the last few decades (Table 1).

(Take in Table 1 here)

Case studies of business reciprocating model change – client side

In parallel with industry developments, and mainly caused by them, clients' use of information and communications technology has advanced quickly. As with most industrial innovations (Mansfield, 1963), there is a significant gap between leaders and followers, both within and between firms. In many cases, leaders in adoption of systems innovations were new companies that could configure themselves around the new capabilities that the new information technology and its ecosystems offered. This is seen clearly in our case studies. A critical role in this was played by ICT technology consultancy firms, which started to emerge in large numbers in the 1980s, but which grew rapidly in size with the entry of global accounting firms into the market. Today, information technology consultants, often supported by information from information technology analysts, play a key role in helping their clients move between business models (Stone *et al.*, 2017a). Today, this industry is dominated by companies such as Accenture, IBM Global Services, Deloitte, McKinsey, PricewaterhouseCoopers, Capgemini, Oracle Consulting, KPMG, and the Boston Consulting Group Inc. Several of these are the consulting arms of information technology companies. These companies are nearly always involved in some way in business model shifts.

This trend has been further enhanced by a distinguishing feature of the fourth ICT model change, the pervasiveness of ICT in every aspect of business life, due to digitalization. Increasing openness of the interface between ICT and client companies has had a significant effect, with significant movement of staff between them (often via the management consultancy companies mentioned above) and learning by client companies of techniques used in ICT industry (e.g. agile project management as applied to software development).

Another factor at work is the balance between the desire to reduce costs by automation (particularly of "back-office" administration), and the need for client-side firms to provide better products and services to their customers. The first ICT industry model change had enormous benefits in terms of the former, but as the ICT business models evolved, ICT innovations allowed client-side companies to provide better products and services, sometimes as substitutes for existing products and services, sometimes as incremental ones e.g. in streaming video and low-cost airline travel, and to improve customer service at all stages of the customer journey,

The direct insurance case study – based on the first ICT industry model change

The initial structure of the industry

The consumer general insurance industry consists of all insurance which is not life or pensions. The main categories of general insurance are motor, house, home contents, pets and travel. General insurance is sold mostly on an annual contract, so the value of each sale is therefore much smaller.

The industry traditionally distinguishes between:

- Direct writers-companies which handle the whole process, from customer recruitment, and underwriting through to claims management;
- The brokers-who recruit and retain customers, and contract the underwriting to traditional insurance companies
- The traditional insurance companies, who marketed entirely through brokers.

The distinction between direct writers and traditional insurance companies should not be confused with that between direct marketing and other methods of communicating and managing customers-although direct writers generally reach their customers by direct marketing techniques.

The new model

In the early 1980s, most general insurance for final consumers was sold by retail agents or broker. Some of these national chains and some were professional practices, e.g. solicitors, accountants. Some selling involved calling salespeople. In 1985, Direct Line, a joint venture between the Royal Bank of Scotland and Peter Wood, entered. Direct Line was one of the first UK financial services companies to have a clear view about which customers it wanted and translate it into marketing, administration and information technology strategies, as follows (Stone *et al.*, 1997):

- Clear market targeting: “vanilla” customer, the family motorist with a good record on claims, occupation and probity, a car that was not high cost, and a clear good residential history.
- Simplified products with few options, e.g. a limited excess possibility and payment options
- Sale by contact centres, with simplified and rapid initial sales and confirmation processes, so contact centre operators could get the details required to write a policy very quickly. There was no need for two mailings, i.e. cover note followed by policy.
- Simplified and rapid after sales claims service processes, with most details being collected by telephone
- Direct response television for initiating customer recruitment, driving customers to the call centre
- Inbound telemarketing - Direct Line was one of the first financial services companies to use inbound telemarketing for customer recruitment, requiring consumers to trust the telephone for doing business with a financial services company
- Strong branding as a new entrant into the market, where customers were known for their conservatism and inertia, using a red telephone as a branding device
- Excellent media buying - using the best media buying expertise, with reporting techniques built into systems to allow the company to identify the best media approaches
- Measurement mechanisms enabling the company to quickly measure progress against its objectives

Systems innovations deriving from the new model of the IT industry

The three major components of Direct Line’s systems approach were the following:

- Advanced American call centre technology and practice: Direct Line was one of the first UK financial service providers to really understand how to deploy the call centre approach to customer recruitment. This approach, closely linked with its media buying and its approaches, ensured rapid and low-cost processing of customer calls. Customers were quickly identified through their postcodes. Having full data on customers facilitated a rapid risk assessment and quotation. Aspect was the US company which provides the contact centre technology that Direct Line needed, and Aspect’s solutions sellers were central in helping Direct Line establish the business,
- Tried and tested mainframe computer systems from IBM. Direct Line was probably the first UK financial services company of any kind whose systems were designed to support completely their business processes, rather than to support just the operational process, i.e. policy issue and claims management. IBM solutions salespeople were heavily involved in putting together the required solution, which was adapted from bank transaction processing technology. Most competitors still had many uncomputerized documentation and payment processes.
- Very high-speed laser printing, allowing policy documents to be produced until late in the evening and then, by special arrangement with the British postal service, to be delivered to customers the next day.

Results

This approach revolutionized the market. At its peak in the early 1990s, Direct Line had about 2 million of the 20 million UK motor policies and became market leader in motor insurance. The direct approach resulted in administrative expense levels of about 10%, compared with the norm of 20-30%. It took some time for competitors to emulate the approach – 5-10 years. Modifying existing IT systems proved problematic, and most had to completely renew their systems.

Since then, there have been further business model changes in the industry, particularly those triggered by the third ICT model change, the rise of aggregators as the new intermediaries. They have changed end customer expectations and used ICT to change the commercial relationship with insurers. Most aggregators have greater understanding and sophistication in pricing than traditional insurers and have created new markets in data sharing that did not exist before.

The airline industry case study – mostly the second and third ICT industry model change

Innovation in distribution systems

Airlines were early adopters of advanced information technology (Buhalis, 2004) and have a long history of technological innovation. Lately, the airline industry has used the Internet to improve distribution and cut costs, but the industry was also heavily involved in the earlier changes, using internal operations management systems to manage their complex businesses, add value to customers (e.g. in-flight entertainment), customer service (airlines were amongst the first big users of contact centre technology before the arrival of the Internet) and extranets to support business to business relationships. Until the 1970s, travel agencies had to locate routes and fares in paper manual and then telephone the airline for availability, reservation and confirmation before ticketing manually. New Computer Reservation Systems (CRS) allowed airlines to manage their inventory and to communicate with travel agencies, consolidators and other distributors and to constantly update routes, availability, and prices. Following deregulation in the US, “fare wars” produced a complicated fares structure and increased computing and communication needs. CRSs’ growing functionality allowed airlines to distribute up to date information world-wide and compete by adapting schedule and fares to demand. CRSs became strategic business units (SBU) as they could generate income and boost airlines’ sales, creating an additional business model for their airline owners. CRS terminals were installed in travel agencies to

allow remote printing of travel documents. CRSs also improved efficiency in sales settlements between airlines and travel agencies, and underpinned frequent flyer programmes. Every airline developed or bought a system. Later, CRSs transformed into Global Distribution Systems, such as Sabre, Galileo, Amadeus and Worldspan, eventually becoming travel supermarkets, covering hotels car hire and a wide range of other services.

Airline industry models

The airline industry is often cited as an example of model change. There are three main models:

- The classic all scheduled airline, covering many destinations and allowing passengers to book to and through destination to other destinations, with very large and varied fleets of airplanes and based at a “flag carrying” hub, offering several classes of seating and using frequent flyer schemes to secure loyalty of business customers
- The low cost model involves simple point to point routing, fleet standardization, single-class, use of secondary airports, all seats sold to maximize yield and no true loyalty scheme, high fleet utilization with fast turn rounds, with significant chargeable extras or “ancillaries” e.g. seat choice, customized meals, car hire and hotels (Casadesus-Masanell and Ricart, 2010; Giesen *et al.*, 2010). Scheduled airlines have tried to deliver a low-cost service but find it hard due to their high cost operating models (Giesen *et al.*, 2009), so tend to use new business units to run the new model.
- The long-haul hub and spoke model, using large planes to move passengers in and out of their hubs, with routes and schedules designed to compete with traditional scheduled airlines’ long-haul routes.

How different models use systems

The scheduled airlines were big beneficiaries of the second IT industry model change, as the developments of the large booking systems depended on the high-volume data processing facilities that emerged in this period. However, they also benefited from distributed computing, as scheduled airlines were characterized by extraordinary complex sets of users, covering every aspect of airline operations and marketing, and using data to plan and optimize their work (Buhalis, 2004). Distributed computing allowed them to access and analyse data and use it for their daily work). One example of how this benefitted marketing was that it was during this period that the many data-based airline loyalty schemes were launched.

Low cost airlines developed simple distribution strategies. They were Internet early adopters, invested heavily in to develop their on-line brand names. They provided incentives for consumers to book online. They avoided distributing their inventory through the Global Distribution Systems. By 2002, EasyJet and Ryanair, were making all their bookings via the Internet. This forced conventional airlines to adopt Internet technology. Low cost airlines used what was called “airline in a box” software, which was a totally integrated solution covering every aspect of an airline’s operation. These were good examples of the second IT industry model software solution.

Video streaming services – based on the fourth ICT industry model change

The market

The streaming video market has is now one of the dominant global forms of entertainment. Its origin was with cable TV and satellite broadcasting companies, but the Internet has transformed the market, opening the door to new entrants such as, Adobe, Amazon, Hulu (from The Walt Disney Company, Comcast and Twenty-First Century Fox), Google’s YouTube, Home Box Office (HBO), Microsoft and Netflix (originally a DVD rental company). Demand is growing, with smartphones increasingly used to watch TV shows, live sport, movies, TV shows and events and to take part in multiplayer games. All providers are supplying wide ranges range of streaming services and content, with further progress in 5G (fifth generation) mobile networks and other digital technologies, supported by partnerships with telecommunications network providers and video streaming providers.

News, sporting events and live concerts still provide the main audiences for television networks, and some streaming service providers e.g. Netflix do not provide this. However, Hulu and YouTube TV offer live TV streaming alongside video services. Netflix, Hulu, and Amazon Prime Video offer a big library of movies and television programs. Agreements with television networks permit them to distribute past and current seasons of popular programs.

Netflix was founded in 1997 but did not launch its streaming service until 2007. It competed with video rental by offering online movie for a low subscription. As technology and video services evolved, Netflix saw the opportunity to tallow access via game consoles, internet-enabled TVs, mobile devices, Apple TV, Roku, Chromecast, and the like. As new competitors entered, Netflix differentiated by offering Netflix originals, particularly for series, many of which have become the central focus of binge-watching (Merikivi *et al.*, 2019)

How Netflix uses data

Netflix Inc. uses big data technology to understand customers’ viewing habits and to support a recommendation engine for customers (Chai and Shih, 2017). This business to consumer relationship then drives its decisions about what content to acquire and increasingly, to develop itself as Netflix Originals. In an interview with Netflix’s engineering director and vice president of product innovation, Vanderbilt (2013) identifies how volume and velocity of big data algorithms in tracking customer viewing behaviour was fundamental to Netflix’s ability to read customer preferences and provide better service to their customers and feedback to content providers (Pääkkönen and Pakkala, 2015).

Netflix's entry into the market was disruptive for some of the other companies in the video-on-demand market, particularly cable and satellite TV companies, except where they focused on sport and other live events, a market in which Netflix does not compete.

Relationship with Amazon Web Services

Netflix uses Amazon Web Services (AWS) for much of its computing and storage needs, including databases, analytics, recommendation engines, video transcoding, and other areas. It hosts some of its data on Amazon Web Services. It has moved away from its own Netflix data centers, and data including usage by customers, searching for videos, personalization of recommendations, and billing hosted by Amazon Web Services (AWS) and used to track users, their signing up to the service, preferences and viewing (including whether they are part-way through watching) and their clicks, as well as the catalogue of content (Brodkin, 2016). However, since Amazon Prime's entry into the video streaming business, this raises some interesting questions about whether this policy will continue (Hoff, 2017). However, it took seven years to make the shift, and such if the volume of data concerned and the tough requirements for quality and reliability that it is unlikely that any other supplier can match what AWS delivers. Netflix has several other very large business partners (e.g. in customer relationship management Salesforce.com, and its recent acquisition the data visualization specialist Tableau), whose software and services it uses because they too are large enough to meet Netflix's needs.

Netflix operates many tens of thousands of servers and many tens of petabytes of storage in the Amazon cloud. However, Netflix operates its own content delivery network called Open Connect. Netflix manages Open Connect from Amazon, but the storage boxes holding videos that stream to houses or mobile device are in data centers in Internet service providers' networks or at Internet exchange points, facilities where major network operators exchange traffic. Netflix distributes traffic to Comcast, Verizon, AT&T, and other large network operators at these exchange points. Amazon's cloud network is spread across 12 regions worldwide, each of which has availability zones consisting of one or more data centers. Netflix has multiple backups of all data within AWS. Netflix was responsible for 15% of the total downstream internet traffic globally (Armstrong, 2018), although this had fallen to 12.6% by 2019 (Spangler, 2019), though this decline in share is due the rise in general streaming, not competition from other streaming video services.

The idea of reciprocating business model change

It can be seen from the above three case studies that the business model changes on the client side led to or supported business model change on the client side. This is summarised and represented in the Figure 1, which shows a simplified version of the cycle:

Take in Figure 1 here

A simplified version of the interactions is shown in Table 2 below:

Take in Table 2 here

How reciprocation works, in more detail

The main characteristics of business model reciprocation are summarised in Table 3.

Take in Table 3 here

Variety of influences

The business model reciprocation theory is a hypothesis to explain some aspects of the evolution of business models, particularly as demonstrated in the three industry case studies covered in this article. There are limits to it. In particular, the business models adopted by ICT suppliers are only one influence on the business models of clients. Their strategic contexts are much wider than this. Particularly important strategic factors include their competitive and regulatory positions.

As an example of competitive pressures, if a new entrant into the industry arrives using a business model which exploits the latest developments in information technology, such as big data (Wright et al., 2019), this forces existing players (the incumbents) to adopt the same or a similar model. This is visible in the impact of Amazon on conventional retail firms initially in grocery foods and then in fashion (Jin and Shin, 2020). As an example of regulatory pressures, if a regulator of utilities or telecommunications forces electricity suppliers to make it easy to switch and breaks up the supply chain by separating retail (to final customers) distribution from long distance transmission, the retail suppliers are under pressure to use the most advanced direct and digital marketing techniques to retain their customers and also to win customers from competitors (Aguero and Khoadaei, 2018)

In many client-side industries, such as consumer financial services, utilities and broadcast media, the market leaders or incumbents may be very profitable, have market shares which are well defended, and reluctant to change their business model and sometimes faced with significant constraints on their freedom to act imposed by regulators. Such companies may prefer to set up a secondary business, using a new model, rather than to change themselves. This can be seen in the insurance and airline industries (setting up direct insurance or low-cost airline subsidiaries). This contrasts with companies with no such constraints,

including new entrants, often classed as disruptors (Schiavi and Behr, 2018, Shaughnessy, 2016), who can comprehensively and quickly take advantage of new technologies and generate new revenue streams. They may or may not be threatening to the incumbents, because their activities may be market-broadening, and they may become so large (typically with very positive cash flows) that they have the resources purchase and neutralize or incorporate any start-ups threatening their own business model.

Complexity of phasing

In the above narrative, it might seem as if the phasing of business models on the ICT supplier and client side is neat. However, as our phasing in Table 1 shows, there may be a period of business model overlap. On each side of the market, there are leaders and laggards. It is not always clear, as a business model begins to change on the supplier side, which direction it is going to take. The change may take place mainly through ICT incumbents or may be led by start-ups or companies invading ICT territory. The benefits of ICT changes to clients may not initially be clear, so there may be an extensive period of experimentation, as supplier-side firms try new approaches and client-side firms identify approaches likely to bring most profit and/or market share.

Bi-directionality of change

In the first phases, the direction of change was dominated by supplier-side innovations, but as digitalization has progressed, and as client-side firms are decreasingly dependent on large departments of communication and communications specialists for their exploitation of ICT, clients have increasingly become user innovators, with many people working in data science, data engineering and data operations. Their ideas pass back to suppliers as modifications to their business models. This can be seen in the case of Netflix and other data-intense giants, whose innovations in storage and analysis of very high volumes of data have been a driving force for evolution of cloud storage. In the latter case, a market has been created to exchange ideas, use cases, code and software components. This has led to leading ICT suppliers focusing on enabling platforms, flexible toolsets, application programming interfaces and support for a wide range of open-source coding languages, to support not just ICT departments but a large and rapidly growing variety of client-side users.

Conclusions

In this rapid excursion into the world of two-sided business model change, we have seen how the capabilities provided as a result of the business model changes in the information and communications technology industry have been reflected in business model changes on the client side. The match is by no means perfect, but the interdependence is clear.

In the case studies, client side business models were based partly on outputs from changing supplier-side business models, demonstrating that understanding client side business models and how they arise requires some understanding of changing supplier-side models.

Management implications

The main implication of this article for business to business marketing is that marketing requirements may be determined by strong long-term forces relating to business model change on supplier and or client side. These model changes lead to changes in required marketing capabilities and in marketing strategies, but also to new business opportunities for both suppliers and clients. This means that business to business marketers in high technology industries should familiarize themselves with the business model narrative, which has become part of the narrative of clients, often mentioned in their annual reports explicitly, as in the case of EasyJet (Easyjet, 2020b). Helping clients modify or switch their business models has become an important role of the information and communications technology industry, and how this works will continue to evolve as the ICT industry finds new ways of delivering value. Some client-side companies are aware of the threats posed by competitors using different business models based on ICT innovations, and of the information they need to determine whether the threat is real (Parnell *et al.*, 2018).

The close relationship between ICT suppliers and clients means that many solutions companies focus increasingly on co-creation with clients, some of whom will themselves become suppliers, sometimes innovating, sometimes receiving innovations, partnering with existing competitive suppliers in co-opetitive mode, as their business models change jointly (Ritala *et al.*, 2014). This is visible in how Amazon Web Services manages its relationship with leading clients, holding “jams” or innovation workshops focusing on how both sides can make radical improvements in how they work together, perhaps involving business model modification (Belitski and Herzig, 2018).

Implications, limitations and future research areas

The main limitation of this research is that it is based on a historical narrative, with a focus on three industry case studies. This inevitably simplifies the story. However, this simplification is an abstraction to help researchers identify broad patterns of industrial development and its implications for marketing. Future research should ideally focus on increasing the number of companies covered in the analysis, on both supplier and client side, to explore the many varieties of model change and how they have interacted. Another valuable area for research would focus on the development of possible scenarios for future models and their impact on marketing requirements.

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Phase	Period	Nature of change	Main characteristics	Main impact on clients
0	Until 1960s	Custom building	Virtually all hardware and application software products customer-built	Most companies have large IT departments with strong focus on building applications as well as ensuring reliable operations
1	1960s and 1970s	Move from customized to standard hardware and customized software	From vacuum tubes to integrated circuits Modular hardware and software Rise of minicomputers Big improvement in storage technology – capacity and access speeds Standard but still proprietary software, sometimes customized	Facilitating operational management of large amounts of operational data, particularly in financial services, utilities, mail order, airlines, and its deployment in marketing, customer service and managing accounts
2	1980s	Move to standardization and distributed computing	Standardised, packaged software Personal computers Local area networks Local printing, especially laser and dot-matrix Solutions selling and marketing, partly through customization of standard product Closed innovation	Facilitation of distributed access to databases, modelling, use of data in rapid decision-making Expansion of direct marketing
3	Later 1980s, 1990s	Breaking out of the organization and the journey to digitalization	Internet Wide area networks Telecommunication bandwidth Standardised interfaces between software packages and operating systems Software as a service Outsourcing Mobile access Open innovation	Much wider use of computing, within and between firms and other organisations Much quicker transfer of data and communication Broadening of decision-making on ICT beyond specialist departments
4	2000 onwards	Domination by platforms and centralization, and advanced services	Two-sided platforms Cloud computing Software as a service Big data	Pervasive computing Digitalization Increasing openness of interface between ICT and client companies, with significant movement of staff between them (often via consultancy route) and learning by client companies of techniques used in ICT industry (e.g. agile software development)

Table 1: Business models of ICT industry

Source: The authors

Stage	Suppliers	Clients
1.	Technical innovation(s) occur	Innovations sensed by leading-edge users
2.	New business model opportunity sensed	Leading-edge firms begin to consider possible implications of innovations for their business model
3.	New capability requirements identified, especially in technical, sales and service areas	Leading-edge firms consider threat to existing model Start-ups begin to form based on using new technologies
4.	New business model possibilities identified, including financial, marketing, sales, operational and organisational implications	Leading-edge clients consulted on possible value of new model
5.	New business model decision made, usually incorporating some proprietary element which will enable them to control and subsequent ecosystem	Leading customers consulted about working with new model
6.	Customer consulted about new products and services	Consultation leads to new ways of thinking about use of technology
7.	New products and services developed to enable plan to be delivered, and begin to be marketed	Clients input into development process, and may start to co-create, and to consider changes in their business model
8.	New capabilities (financial, marketing, sales, operational, organisational) start to be developed in one or more firms, while governance implications of new model begin to be understood	New business model possibilities identified, including financial, marketing, sales, operational and organisational implications
9.	New business model developed	Research or other feedback from clients' customer sought, and possibility of clients' using a new model to acquire new sets of customers identified and evaluated, in some cases with help of suppliers Clients consulted about client-facing aspects of new supplier model
10	New business model launched by one or more firms, including governance mechanism	Clients start to plan their own new business models, based on capabilities offered by new business models of suppliers
11	Ecosystem starts to develop and change, in some cases a new ecosystem is created Competitors try to establish rival ecosystems	New products and services developed to enable plan to be delivered, and begin to be marketed Clients begin to develop their own competitive ecosystems
12	Firms using new business model develop transactional strengths, alone and/or with partners Competitors who have developed new model compete by sales and marketing, and by ecosystem and transactional strength	New capabilities (financial, marketing, sales, operational, organisational) start to be developed in one or more firms, while governance implications of new model begin to be understood
13	New business model adopted by most firms Rival ecosystems settle down, and other firms emerge to ensure users can inter-operate between ecosystems	New business model developed, using products and services from new business model suppliers
14	New model's transactional strengths established, removing barriers to adoption by late adopters	New business model launched by one or more firms, including governance mechanism
15	Network effects begin to drive ecosystem and market growth (creative construction) Leading supplier(s) emerge from battle between competitors Suppliers keep a close watch on client ecosystems and try to ensure that they play a key part in those ecosystems	Clients' ecosystem starts to develop and change, in some cases a new ecosystem is created
16	Suppliers start to co-create with clients	Firms using new business model develop transactional strengths, alone and/or with partners, and relying on transactional strengths of suppliers
17	Old model maintained in some firms, often convinced of long-term viability	New business model adopted by most firms, with laggard clients still using products and services of laggard suppliers
18	Market share of firms maintaining old model shrinks Dominant new model firms ensure maintenance of dominance by going for market share	New model's transactional strengths established, removing barriers to adoption by late adopters
19	Further technological innovations occur	Network effects begin to drive ecosystem and market growth (creative construction), but clients begin to anticipate next stage of cycle

Table 2 Stages of business model interaction

Source: The authors

Characteristic	Description
Definition of reciprocating business model innovation	When an innovative business model on one side of the market triggers BMI on the other side. It can take place within supplier groups too (ecosystems), and it works over a period, often a decade or more per cycle.
Direction	B2B suppliers to B2B customers, but it can occur in the other direction e.g. advanced clients requiring new business models from marketing services suppliers, and there may be iterations, when client-side companies take the model change further, requiring further supplier-side changes.
Role of new entrants	Newly created firms (e.g. born digital) may play key role on either side, versus existing firms.
Why it exists	Business model development on the supplier side e.g. from tailor-made software, to packaged software to servitization and solution selling, to platforms, leads to a business model gap opening on client side. Technology push may be followed by demand pull. Firms on both sides of the market have a strategy of innovating to beat competition and building barriers to entry. Can also exist as part of an internal review on client side (process improvement, cost reduction etc.). One element of this can be identifying the potential waste due to suboptimal collaboration with external parties (hence embracing of extranets and collaboration platforms as enabler for wider business model redesign). Clients may want countervailing power, to ensure they do not lose too much value to suppliers. Business to business to consumer model changes are often driven by changes in or unmet end-customer needs and technology being provided by ICT industry to facilitate meeting them. Developments in parallel industries increase end-customer expectations.
How it works	Waves of interrelated capability development on both sides of market, leading to new models, as innovations diffuse. As soon as client-side firm dominates by its model, a new model on supplier side may challenge its model. Client-side models often created by transformational leadership, e.g. via burst of ambidexterity, perhaps agile, before focus on transactional (see below). Clients eventually need to be best practice because of competition but at beginning may be sole operator using a new model.
Enabling factors on client side	Organisation, skills, resources, culture, finance, dynamic capabilities, leadership, managerial team Strategic decision-making process that includes model change as explicit decision Disruptive external change may trigger rapid adoption of new model. External resources, acquisitions, partnerships, outsourcing. End-customer demand.
Benefits to client-side firms	Value capture – from customers and competitive suppliers, for firms, for shareholders, via scale, efficiency and quality and targeting particular segments and building customer relationships and customer communities in them (the B2B2C aspect). Competitive advantage, market share and dominance by scale, unrivalled proposition, strong brand. Creative construction (market widening/deepening, new needs met) and destruction (lower entry barriers, attack weak firms).
Issues for firms	Financing change of model (though where ICT investments are concerned, this is increasingly facilitated by pay as you go and subscription models of ICT industry) Difficulties in managing people aspects of change to new model Multi-model firm may have different status of models in different parts of business. Governance of changing business model. Complacency about robustness of existing business model. Existing ICT infrastructure prevents or restricts move to new business model.

Table 3: Main characteristics of business model reciprocation

Source: The authors

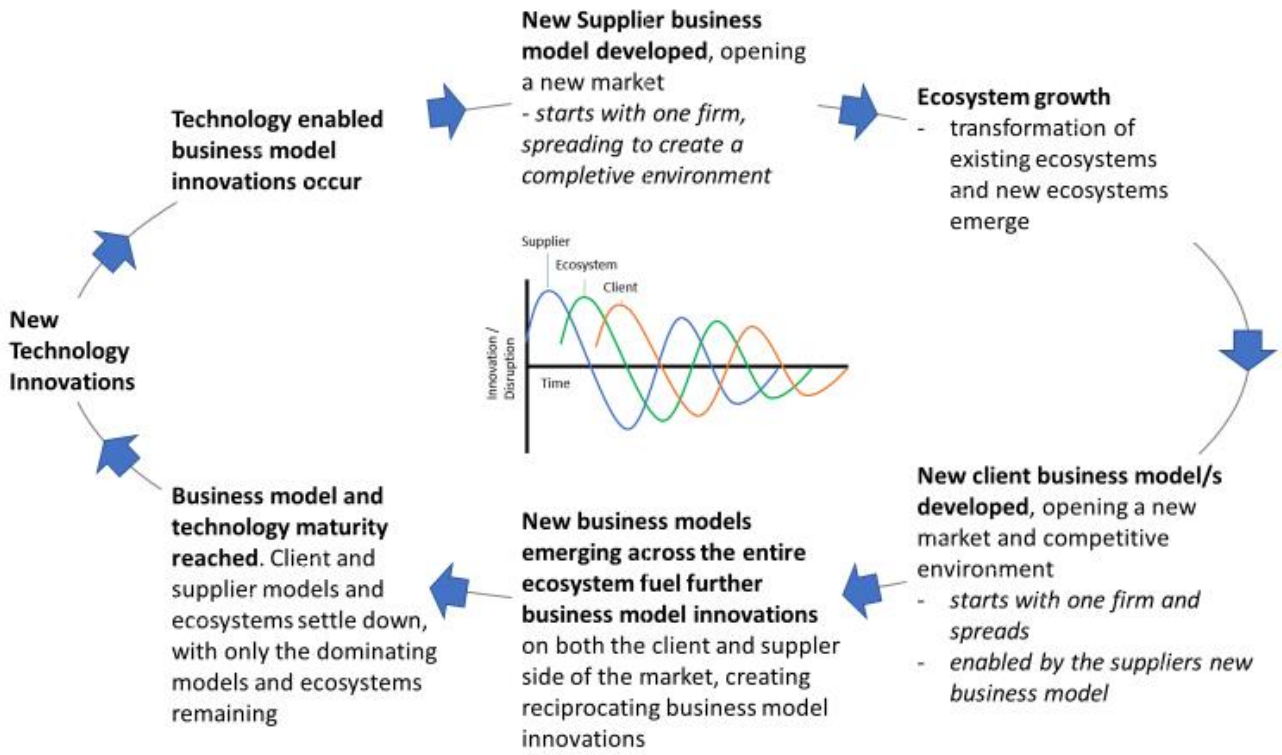


Figure 1: Simplified cycle of supplier-client business models evolution

Source: The authors