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### Influence of new business models and technology on technology strategy and partnerships

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## 2

# INFLUENCE OF NEW BUSINESS MODELS AND TECHNOLOGY ON TECHNOLOGY STRATEGY AND PARTNERSHIPS

*Christopher P. Holland*

### 2.1 Introduction

The relationship between Information Technology (IT) and business strategy has evolved, as technology has become more embedded in organizational processes and strategies. In the 1980s and 1990s, research articles and business publications emphasized the importance of IT and strategy alignment [1,2], while companies wrestled with the implementation of Enterprise Resource Planning (ERP) and supply chain management systems [3]. In the late 1990s, the emergence of e-commerce in both business and consumer markets opened up a whole new set of opportunities and challenges and saw the emergence of the early retail technology giants such as eBay and Amazon. Academic researchers and business commentators quickly realized that IT was not simply a supporting function but had the potential to generate competitive advantage and also to create new types of organizations and markets, which simply didn't or couldn't exist without digital technology. Leaving aside the debate on whether or not IT can create competitive advantage [4,5], its central role in the design, operation and growth of modern business organizations and market networks cannot be disputed [6].

The strategic role of technology is exemplified by the emergence of new types of business models across sectors, for example Elimica and Li & Fung in supply chain management, Uber and Didi in transportation, Airbnb and Expedia in travel and hotels, and Strava in social media sports. In these examples of business model innovation, technology is not simply a supporting function but instead is the genesis of the business model and vital to its continuing operations and evolution, i.e. technology is an integral component of key activities such as customer acquisition and retention strategies and the delivery of the product or service. The software encapsulates the algorithms that act as recommendation agents and manage the social media feedback process, which enables the development of trust between participants. The technology also plays a crucial role in the organization and management of supply capacity, e.g. rooms or drivers, and in the development of social capital that binds these enterprises together and makes them accessible and usable to both customers and workers alike. These recent developments raise important questions regarding the way that IT is conceptualized and related to business constructs such as strategy and outsourcing. One way of incorporating technology into business thinking is through the idea of business models [7–10].

Theoreticians have recognized that new developments in business models and technology require a new outlook on how to conceptualize business and technology as separate entities, and in their inter-dependency with each other. For example, in a review of Information Systems (IS) strategy models, three distinct groups of models were identified: (1) IS strategy as a support function; (2) IS strategy as a plan for the IS function itself and (3) IS strategy as a shared view of the broader role of IS within the organization [11]. In a similar vein, but focused on digital business strategy, a transition from IS is a supporting function to a fusion of IT and business, where IT and business are equal in importance [12], i.e. neither is subservient to the other but instead are related to each other in a recursive manner. In this view, IT plays a crucial role in all aspects of the supply chain, including business-to-business supply management innovations, and in retail customer-facing activities. The business model concept takes this a stage further by placing technology as an integral component together with business constructs that form an overall logic, or model of how a business works, which can be used as a strategy blueprint, and in the Internet era, for raising funds for new ideas and ventures.

The question remains though of how to manage IT? Does its strategic importance mean that it needs to be controlled closely and ‘owned’ by the business? Or is it possible to outsource technology and treat it as an input function, rather like a raw material or component supplier to a manufacturing business? A different model is to think of relationships between a company and its technology providers as partnerships, the implication being that these relationships are much more dynamic and can change in response to competitive pressures, new strategic intent and business performance.

One way of exploring this problem is to examine new business models where technology appears, *prima facie*, to play such a crucial role in the success of companies such as Airbnb or Uber and many other innovative companies that are often called ‘industry disruptors’. By gaining a better understanding of the *avant-garde* of the digital revolution, it should be possible to develop more general insights and ideas into the relationships between technology and business, and the appropriate types of relationships with technology vendors and consultants. In the next section, a brief review of historical themes that preceded business model concepts is presented. This is relevant to the discussion of business models because many of the concepts from earlier academic and business discussion underpin the development of the business model framework. The ideas are therefore still valid and apply to some extent equally well to today’s IT management issues.

## 2.2 Historical themes

### 2.2.1 IT and management

A comment about the general nature of IT and its relationship with management is a logical place to start and it may also partly explain the complexity and inherent difficulty of managing IT resources and the roles of information and communication in management. Fundamentally, management is the coordination of economic activity and the only way to coordinate activities of any kind is through the sharing, i.e. communication, of meaningful information [13]. The key phrase here is the communication of information, rather than the processing of information, or storage. Computers on their own would therefore have relatively little impact on management – it is only when they are connected together in networks, that computers create IT systems – that process, store and communicate information, and therefore influence management in a direct and fundamental manner, by changing the

coordination of activities. IT systems and management are therefore closely bound up with each other because changes to networked IT systems inevitably lead to new forms of decision-making and organizational change [13]. Other technologies, e.g. production technologies, or developments in materials, do not have this direct relationship with management.

### **2.2.2 The productivity paradox**

Despite huge investments into new IT systems in the 1980s, there was not an accompanying significant growth in productivity. The term ‘productivity paradox’ was coined to capture the situation where productivity gains were only marginal and not as high as expected in the US economy [14]. Several explanations have been suggested, and perhaps the most relevant one to this discussion related to business models is the idea that most companies only changed their technology and did not attempt to significantly improve on their existing business model or create brand new ones, which led to the philosophy of Business Process Reengineering (BPR) [15] that was arguably the precursor to business model redesign.

Another explanation is that IT was viewed as a capital resource, and the emphasis was therefore on the efficient management of the technology itself to reduce IT costs, and less effort was spent on its creative potential. In this environment, it was quite natural to treat IT as an input into an organization’s activities, together with raw materials, staff, components, energy and so on. It was therefore a logical strategy to outsource IT systems to specialist providers.

### **2.2.3 Outsourcing**

Some commentators might argue that the use of shared mainframe systems in the 1970s was the first example of outsourcing but the distinction is that companies bought computing power from mainframe suppliers and never directly owned and controlled it. It’s not possible to ‘outsource’ something that is not currently owned and managed within the enterprise, though there are clearly parallels between buying mainframe computing power on a ‘per use’ basis and today’s Cloud computing services.

The business practice of IToutsourcing first came to prominence in the 1980s, mainly in large organizations. Outsourcing part or all of a company’s IT systems was seen as a way of gaining control over an expensive and fast-changing capital infrastructure [16]. The idea was taken further still by increasing the scope of the outsourcing to include business processes. This was a natural development because the IT systems defined and contained the business processes. Indeed, it was actually quite hard to separate processes from systems, as had been discovered in much earlier research [13] and the technology of enterprise systems explicitly linked common databases with functional areas of a business and software configuration was linked directly to business process design [17].

To many CEOs grappling with new technology such as Enterprise Resource Planning (ERP) systems and Personal Computers (PCs) for all administrative workers and managers, IT was a necessary evil. Companies could not survive without these new systems because the core business processes of large organizations were being automated: sales order processing, production, warehousing, finance and marketing. In addition, the first developments of e-commerce were happening in the form of Electronic Data Interchange (EDI) with the potential of integrated supply chains. Waves of new technology including ERP systems, EDI, PCs and smart software to manage the supply chain were introduced in order to achieve an organization-wide view of information and performance across all functional areas of the

business and increased integration along the supply chain. In addition, large companies also had the problems of managing legacy systems in parallel with new developments.

#### **2.2.4 Information Technology and competitive advantage?**

The sheer scale of investments into IT systems in the 1980s and 1990s meant that IT costs came under increased scrutiny and questions about its economic and strategic benefits were naturally raised. Two statistics stand out from this era. In the US economy in the 1980s, firms spent a trillion dollars on IT yet failed to realize significant economic productivity. In the 1990s, IT investment accounted for almost half of most firms' capital expenditures [16]. It is then not surprising that the value of IT outsourcing grew rapidly in the 1980s and 1990s in response to clear and difficult challenges.

Although there were isolated, almost storied examples of IT and competitive advantage in the 1980s and 1990s such as American Airlines and Baxter Travenol Healthcare [18,19], these were very much the exception rather than the rule. Most managers were much more concerned with the successful implementation of new technology, IT cost justification in terms of administrative and headcount savings and figuring out ways of keeping it running in an orderly and cost-effective manner, i.e. maintenance, technical support and software package updates. The argument put forward by Carr in his controversial book *IT Doesn't Matter* argued persuasively that managers should focus on IT cost management and risk reduction of IT projects, and stop seeking out mythical competitive advantage [20]. Carr's arguments strongly support the ethos of outsourcing of IT systems.

In summary, outsourcing seemed to be a good solution to managing complex and costly IT systems that required teams of specialized staff to operate them and offered operational performance benefits only. The outsourcing companies could manage IT systems more effectively by exploiting their economies of scale and also economies of scope because they were able to employ staff with a broad range of technology skills that led to synergistic benefits, not least, in terms of integrating separate systems and technologies together. But there were also significant problems starting to emerge in two distinct areas. First, what if the outsourcing arrangements soured or went wrong? Who was to blame, and what were the consequences?

In the case of Sainsbury's, which entered into a multi-billion dollar outsourcing deal with Accenture in 2000, the decision was reversed before the end of the contract because of poor logistics performance and resulted in a significant write-down of IT assets [21,22]. Other companies that struggled with moving beyond complex legacy systems include Sears. When Sears merged with Kmart, Kmart had multiple systems for each logistics area, inventory (3), logistics (5), supply chain management (5) and merchandise planning systems (4). Sears had a similarly complex set of legacy systems. In the article titled 'Code Blue', the sheer complexity of Kmart's IT systems is shown in an inventory of its base systems for different functional areas. It had technology partnerships with i2, IBM, GEIS, PriceWaterhouseCoopers, Manugistics, JDA, NCR Corp., NCR and others [23]. In this type of situation, it would be extremely difficult to think about new business models based on a blank sheet of paper with this huge inertia from legacy systems. Over the period 2006–2016, Sears lost 96% of its market capitalization. Of course, its legacy systems were not the only explanation for its dismal performance but they played a vital role in hampering their ability to adapt to the growth of the Internet as a sales and search channel, and also made it extremely difficult to integrate the two companies onto a common technology platform.

The point here is that IT can be a remarkable tool to create new business models, re-engineer existing ones, but as the technology changes, as new business models emerge, those companies that mismanage their IT systems and are unable to adapt and change their business models can fail spectacularly. Conversely, IT coupled with novel business models can create enormous value.

The second issue with outsourcing is: how should a company react when the technology landscape changes dramatically? If it has outsourced its IT capabilities, this could place it in a disadvantaged position because it no longer owns or controls its own staff and systems. One way of thinking about this problem is to group technologies into stable and emerging technology. The rate of change in a technology is of crucial importance in determining how a company should choose to manage a particular technology, in particular how it works with technology companies and these issues are discussed in the next section.

### **2.2.5 Change and stability**

Several important themes emerge from this initial exploration of IT and business change. IT has evolved very quickly over the past 40 years and continues to change rapidly. While some aspects of IT appear to have ‘settled down’, i.e. become relatively stable and homogenous, other aspects of technology continue to raise many unknown threats and opportunities, e.g. the Internet of Things and cognitive computing. In the product lifecycle of technology, there is constant change and adaptation in the initial and growth stages, followed by a period of relative stability in the maturity phase. The introduction of a new technology may then stimulate the move towards a period of further change.

For example, large corporations first implemented ERP systems in the late 1980s, in order to impose a set of standards and disciplines on business processes, often on an international scale. The ERP systems continued to develop enhanced functionality and new capabilities, and new versions of the software were released on a regular basis but the core concept and capabilities of an ERP system settled down, and the market matured, evidenced by the emergence of simpler, cut-down versions of the software, that were simpler to manage and implement, and were priced more attractively for smaller businesses.

Of course, the large vendors SAP and Oracle continued to develop new software functionality, but the main developments were in areas that were arguably unrelated to the original concept of an enterprise system, e.g. data analytics and supply chain management systems. The core ERP systems themselves could be accurately described as a stable technology. The next main technology change was not to do with the software itself, but how it was managed and delivered. Cloud computing services made it possible to deliver the software remotely, which reduced the IT infrastructure requirements for the business, and also made it possible to introduce new pricing mechanisms, e.g. on a per transaction basis with very little or no upfront capital cost to the ERP project.

ERP development is a classic example of a new technology that was widely adopted, settled into a period of stability and maturity, and then underwent a further transformation through the introduction of another technology, Cloud computing. Similar observations can be made regarding the development of trading networks based on EDI where the technology matured and was then superseded very quickly by Internet standards.

A lot of the core IT infrastructure such as networks, operating systems, data storage, processors and transaction software systems are in a mature stage of development. The new technologies outlined in Table 2.1 are still in a state of flux, and it is difficult to predict even

their technical trajectory let alone their likely business importance. Managing stable and emerging technologies presents very different sets of problems that require different skills sets, staff, strategic objectives and philosophies. Companies therefore need to distinguish between stable technologies and new technologies.

Looking forward, two themes emerge that will arguably have the most influence on how firms approach the management of IT systems. The first is that over the next five to ten years, a new wave of IT is apparent. This is termed 'new emerging technology'. The second is the business phenomenon of novel business models that have disrupted whole industries, on a global scale. It is argued that these two phenomena should be viewed together and that it is necessary to develop technology partnerships to compete successfully and exploit new technologies in a rapidly changing business landscape.

## 2.3 Review of emerging technology and new business models

### 2.3.1 Emerging technology

Emerging technology is not a single new development or innovation but rather a wave of inter-related technologies that together create a new technology landscape where there are arguably very few significant technology barriers to the development of new business models. In the same way that ERP and supply chain systems emerged in the 1980s and early 1990s and transformed organization design and business processes, the Internet and e-commerce started to revolutionize retailing in the late 1990s and social media that only appeared in the 2000s has redefined the dynamics and rules of communication, the current wave of emerging technologies is reshaping the business models of individual companies that are in turn disrupting whole industries. This idea is perhaps best explained by Marc Andreessen, who has been at the forefront of technology and business throughout his career. He describes the current position as 'software is eating the world' [24]. An overview of the emerging technology is given in Table 2.1.

The technologies outlined in Table 2.1 act in tandem with each other and it is their collective impact that matters. The combination of the individual technologies leads to a rich and diverse set of outcomes, not least the initiation of many new start-ups, some of which will blossom into successful companies. Uber, the poster child of new business models, uses a combination of the ubiquity of mobile phones, a smart app to connect customers with drivers, social media systems to review both drivers and customers, automated billing and payment systems that give surety of payment for the driver and security for the customer, and a technology platform that once it has started benefits from network economics [25], which makes it more attractive to customers and therefore increases the incentive for new drivers to join, which in turn increases customer service and stimulates further demand. Data analytics of the sea of data generated from this business are then used to further refine new customer acquisition strategies, shape incentives for customers and drivers, and are used to design dynamic pricing strategies.

In some ways, there is nothing new in the pattern of technology innovation here. Technology innovation has always worked in this manner, where a set of seemingly diverse and unrelated developments come together in a coherent manner to create a new product or service. For example, the PC revolution that started in the 1980s depended crucially on the widespread availability of general purpose computing chips, memory chips, hard disk drives for data storage and useful business software. In turn, the PC paved the way for the e-commerce revolution when the Internet became usable to the general



Table 2.1 Definition of the main categories of new emerging technology

<i>Technology</i>	<i>Technology implications and business consequences</i>
Mobile connectivity from Wi-Fi and mobile networks	Pervasive and low-cost, high-bandwidth connectivity between individuals, business organizations, market networks and government, and also between physical entities that form the Internet of Things (IOT)
Internet of Things	Connection between all types of physical devices such as clothes, household appliances, industrial infrastructure, buildings, public lighting systems, security devices and transport, which generates large volumes of new forms of data that can potentially be used in creative and novel ways to improve existing services and develop ones
Software development platforms	Ease of software development, and opening up of software development opportunities to non-experts
Cloud computing	Cheap and flexible data storage, access to low-cost processing power by anyone, removal of high initial capital costs to new technology projects, access to high-quality systems on a per transaction basis, simplification of technology maintenance by separating technology infrastructure from software services
Encryption standards	Secure communication is open to everyone, including individuals and new entrants as well as large corporations and government organizations
Virtual currencies	Bitcoin and similar developments simplify the payment systems for business models that require complex interactions between groups of individuals and organizations that often require high volumes of low value payments
Platforms for everything	Critical mass can be achieved in almost any market in a very short space of time, e.g. markets for software developers, trading platforms, online music and films, knowledge exchange in specialized fields, social media communication and government services
Virtual reality	Rich, interactive interfaces that are necessary for complex and services that require an immersive and realistic virtual experience, e.g. online gaming and remote surgery
Artificial intelligence	Smart interfaces between man and machine to enhance everyday services and enable non-technical individuals to access complex services without understanding the intricacies of how systems work
Big data and analytics	Application of analytical techniques and often large amounts of processing power to uncover and make sense of all types of data
Machine learning	Automation of analytics and pattern finding
3D printing	Distributed manufacturing and production management based on additive 3D printing and manufacturing technology

public through the availability of easy-to-use World-Wide-Web interfaces such as Mosaic and Internet Explorer.

To explore how the technologies shown in Table 2.1 create new possibilities and underpin novel business models, three case vignettes are presented in Table 2.2. The purpose is to illustrate the characteristics and operations of a range of business models, and to explore the role of technology and how it relates to activities, or business processes such as new customer acquisition, and growth. A lifecycle framework of business models is used starting with technology, the launch of the company with a product offer, the acquisition and retention of customers, the growth strategy and then an overview of the business model.



Table 2.2 New business models and the role of new, emerging technology

	<i>Big data technologies</i>	<i>Launch and product offer</i>	<i>Customer acquisition and retention</i>	<i>Growth strategy</i>	<i>Business model</i>
Sharing economy: Didi	Relatively simple mobile app that relied on high penetration of mobile phones. Technology partnership with Tencent proved vital for both technology infrastructure and digital payments.	The company offered its app to taxi drivers (yellow cabs in China), who far outnumber private vehicles, and targeted young drivers who already had mobile phones and were more likely to share the app with friends and colleagues. The launch city was Shenzhen because of its lower regulatory hurdles.	Heavy use of promotional codes and discounts to increase the customer database, in severe competition, in particular with Uber.	Geographic expansion across China, where each market is local to a city and through acquisition in the USA via a shareholding in Lyft.	Build market power through the simultaneous recruitment of taxi drivers (followed by other categories of drivers, i.e. limousines, private cars and buses), and customers on a city-by-city basis. Estimated penetration of app with taxi drivers is 80%, which is strong evidence of benefitting from network economics, where the growth in customers and taxi capacity have a positive influence on each other, and then build significant barriers to entry for new startups.

<p>Digital intermediary and comparison tool: Expedia</p>	<p>The company launched from within Microsoft and was designed to showcase the innovative use of technology for the travel industry. The partnership with Microsoft gave it access to technology expertise and seed-corn funding.</p>	<p>The original concept of Expedia was a technology start-up for the travel industry. The product offer is very simple and compelling: to offer price and product comparisons across a wide choice of airlines, hotels, car hire, ancillary travel services and holiday packages to consumers through an advanced search platform. The principal customer benefit is an easy to use, fast search process, across a large number of providers. Expedia's product offers have since expanded to include technology platforms that its travel partners use to manage their own businesses, e.g. the packaging and presentation of hotel information directly to customers through a hotel's own websites and also through intermediaries.</p>	<p>The venture capital funding that made the company more independent from Microsoft was spent largely on promotions and marketing activity to grow the customer base to a critical mass that would enable it to generate transaction fees from airlines and hotels, and also to make it more attractive for new travel companies so they use its platform as a distribution channel.</p>	<p>Expedia has grown to be one of the world's largest travel intermediaries through a comparison of organic growth that has benefited from network economics and also from a significant number of acquisitions of related travel platforms.</p>	<p>There is no single 'business model' that encapsulates the company's activities. The original concept was to showcase the use of technology in the travel industry, and this resulted in the digital intermediary concept, where Expedia is an intermediary or travel agent (Ye et al. 2017). Based on its spate of acquisitions and the push towards the vertical integration of technology into travel provider's IT infrastructure, the company also resembles a technology solutions provider, where it sells travel software to hotels, airlines, car hire and other travel companies.</p>
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	<i>Big data technologies</i>	<i>Launch and product offer</i>	<i>Customer acquisition and retention</i>	<i>Growth strategy</i>	<i>Business model</i>
Social media: strava	The founders already had experience of running technology companies, and Strava is fundamentally a specialist social network, which is targeted at athletes. The company manages its own software development, which is important because almost all product innovations rely on new Strava software developments and partnerships with other technology companies such as smartphone platforms, specialist GPS device and camera manufacturers.	Strava is a social network for athletes that has two main benefits: (1) motivate athletes to train better through competition with themselves over time and with other athletes; (2) entertain athletes and encourage them to continue with their activities. In cycling, separate riders can compete against each other for specific sections of rides termed 'segments', which enable direct comparability. The company launched into a single sports sector, cycling, in order to build a critical mass of riders. Cycling and running account for 90% of the users, with 26 other sports accounting for the remaining 10%.	Around 80% of new customers initially sign on through a mobile app, and many of these then switch to specific GPS cycling devices to track their rides. Customers sign up to a free app and are then encouraged to become 'active', i.e. to post details of their rides and also to follow other riders, and to be followed, so that they are more likely to continue to use the service. The product innovation strategy is to incrementally improve it, e.g. better personalization, security, ride features, live segments.	The company enjoyed six years of organic growth through word of mouth, starting with elite cyclists and then broadening its appeal to a larger cycling audience and then to the running community. Cycling 'influencers' are targeted, and the company focuses on around 12 cities worldwide for most of its growth. Smartphone penetration provides the crucial technology infrastructure to sign new customers via apps. The sales funnel is very simple: free users, active users who upload rides, premium users. Active users and social connectivity are two crucial components that determine the conversion level from free to premium user.	The free sign-up of new athletes encourages use of the application and is an opportunity to showcase the benefits of the social network. In addition, free users generate valuable data for other users, e.g. times, distances, routes and comments, as well as introducing their friends. There is an opportunity to cross-sell GPS tracking devices and a spinoff service, Strava Metro, exploits the athletes' big data from GPS tracking for city and town planning, where cycle and walkways are important elements of urban design and planning.

## 2.4 Discussion

Each of the companies in Table 2.2 is an example of a type of new business model, broadly categorized by sharing economy, digital intermediary and comparison tool, behavioural ecosystems and social media. Other categories of business model include trading platforms (eBay, Taobao, Amazon), streaming services (Netflix, Spotify) and Business-to-Business (B2B) focused platforms (Elimica, Covisint, Li & Fung). In addition, there is extensive use of apps for simple e-service applications that connect business organizations directly with consumers, i.e. with no wider networking with other consumers or links to multiple businesses. For example, airline apps for online ticketing, boarding, flight information and payment, and mobile phone apps for online top-ups of pre-paid phones and account management.

It is argued that each of the companies in Table 2.2 is representative in a broad sense of its group, and the use of these individual companies as examples therefore has implications for new business models and the associated use of technology in general. The other categories of business models could be used to extend the argument.

Didi is an example of the sharing economy, which includes Airbnb, Uber, Lyft and many other smaller examples. The term sharing economy, or collaborative consumption, is applied to a whole category of new types of business, which are based on the novel use of technology to enable new forms of coordination that make it economically possible to share resources, whether this is to share cars, lawn mowers, spare rooms or whatever. These services tend to emphasize the peer-to-peer nature of the sharing, though the extent of the influence of the technology platform over the providers is clearly open to debate, e.g. see the recent discussion about whether Uber drivers are private providers of 'spare' driving capacity, or are employees. However, the crucial point with respect to new types of business models is that technology is at the centre of the sharing economy business models, and these new businesses epitomize the effects of Information Systems to reduce coordination costs and match providers and users of a range of services that would otherwise not even be aware of each other. In a sense, the structures in these business models were predicted by the electronic markets hypothesis [26], though the resulting networks of organizations and individuals are perhaps better described as market networks that incorporate businesses and consumers rather than electronic markets. The business models described in Table 2.1, together with business-to-business examples of Elimica, Covisint and Li & Fung, align more closely with the theories of smart market networks [6, 27] and mixed mode network structures [28], and move to the middle [29] theories.

The fact that technology is at the heart of the business model is also true for the digital intermediaries such as Expedia, moneysavingexpert, ctrip and hotels.com, and also for the social media companies such as Strava.com. This is important because it raises important questions about the conceptualization and understanding of IT and business. An impact-theoretic approach [29, 30], where IT is viewed as an external factor impacting on a company's strategy, organization and operations is clearly inadequate [31] and a more nuanced approach is required that captures the interactions between managerial actions, technology and business constructs, and the relationships between them. The work of Chen and others [11] also seems to fall short because their most advanced model describes IS strategy as the shared view of its broad role within the organization. The positioning of IT and business as separate and equal is perhaps closer to what is required [12] but even this approach may be insufficient to capture what is happening with the rapid changes in business models.

The new business models have several things in common with each other, and the examples in Table 2.2 are used to illustrate the points.

### **2.4.1 Information-centric businesses**

They are all information-centric businesses, which make them technology-centric businesses. What I mean by information-centric is that the strategic logic and operations of the business model are defined and managed in terms of the capture, storage, processing and sharing of information between the social and business networks of customers, individual providers, business organizations and the digital platforms themselves. Although it is possible to separate technology from the strategy, in practice it makes much more sense to consider them together in a holistic manner.

Consider the problem of allocating a driver to a Didi customer. The request is captured via a mobile app, which then goes to a central server that relays back relevant drivers within a geographic proximity of the customer, together with driver ratings and feedback. In parallel, the customer information is sent to drivers who are also able to see information about the customer. On the basis of this exchange of information, a matching process takes place and the driver is directed to the customer's location. The whole process is defined in terms of information and the associated use of technology and it is much easier to define, model, comprehend and change, if one considers technology and business simultaneously.

### **2.4.2 Technology-induced disruption**

Technology-induced business disruption creates opportunities for new companies to enter a market. The general explanation for this phenomenon is that existing companies have vested interests in maintaining the status quo and are therefore unlikely to destroy themselves by building a competing organization. They also have extensive investments into their current business models, including legacy information systems, relationships with trading partners, as well as operations and cultures that are designed around their current way of doing business. All of these elements are difficult to change individually, and to change them all requires a herculean effort. Perhaps the best example of a company that epitomizes these issues is that of Kmart.

### **2.4.3 Business model launch patterns**

The launch and growth of these new businesses required a combination of innovative technology coupled with novel marketing strategies to reach a critical mass of users, and then to exploit network effects accompanied by a period of continuous improvements. A significant part of Expedia's initial funding was spent on promotional activity to build up the customer base, which then enabled Expedia to attract more airline companies onto the platform. Once a critical mass of customers and airlines was reached, the platform benefited from network effects, which allowed it to grow organically through word of mouth with consumers, and the larger customer base made it an important distribution channel for airlines, so they were encouraged to remain on the platform. Strava focused all of its initial marketing efforts on a single sector, cycling, and targeted its offer on elite cyclists, in order to build a critical mass and not dilute its resources. Once users started to sign onto the service, the appeal was widened to a broader range of cyclists and then to runners and other sports.

### **2.4.4 Network scale versus market share**

The scale of the network is important to create value for different members of the technology platform, whether these are airline companies on Expedia, taxi drivers on Didi or cyclists

on Strava. Taking an extreme example of Ford in the 1920s, which was a highly vertically integrated business, the benefits from its size were economies of scale in production, distribution and marketing. There were also significant economies of scope with the introduction of new models. Of course, Ford now works with many more suppliers and is less vertically integrated, but it still enjoys significant economies of scale and scope in its operations. These same benefits also apply to today's largest retailers such as Walmart and Tesco. However, the definition of scale is different in a network economy and network scale features in many new business models.

In the Strava example, scale still matters but it is very different because it is not concerned with ownership of assets but rather control over information. The key variable for a sports social network that matters most to potential new customers is the number of active athletes in their chosen sport in their geographic location. A large number of riders in San Francisco are of little or no value to a potential customer in Chicago or London. The network economics are important because they determine the nature of competition, in particular the ability to acquire and retain customers [25]. For many new business models, the size and growth of the technology platform are the key measures of success, which ultimately determine long-term survival and profitability.

The measurement of network size needs to be carefully defined because the market definition needs to incorporate (a) sector, (b) type of athlete (elite, club runner, jogger, event participant) and (c) geographic location. This also means that marketing efforts need to take these factors into account, which is why marketing that is focused on specific cities is important, and the network influencers are important targets to 'seed' the network. This measurement of network size has parallels with the measurement of market share at a local level, e.g. to measure the market share of a bank in the 1980s before the Internet, then this could be done nationally, within a geographic region (e.g. US State or city), or by individual branch.

#### ***2.4.5 The technology encapsulates the definition and operations of the business model***

The role of technology in all of these business models is to define and encapsulate the business model, which comprises a range of inter-related business processes that connect individuals and organizations. It is not accurate to think of IT as a separate entity, or artefact. It is rather the ether in which the business model exists. The definition of the individual business processes and the relationships between them are captured as information templates that are then instantiated through digital technology.

An important implication of technology encapsulation of business processes is that changes to any business process or relationship between them, whether this is the product offer, the nature of the customer acquisition process, pricing algorithms or the relationship with external partners to stimulate growth, all require concomitant changes to the technology. The business processes and technology are inseparable. By separating them, the essence and characteristics of the business model are lost.

The business model can be described in terms of an information template, without reference to technology, but it can only operate with digital technology. This is similar to the production component of an ERP system, which can be described in terms of materials requirements planning algorithms and an information specification, but it can only be implemented, at least on any kind of scale, using databases, software and networked systems.

A further implication of the tight coupling between technology and the business model is that any type of innovation or improvement to a business model – whether this is to

develop easier-to-use software, build new product attributes through new software features – improved data analytics to offer new services or enhance existing ones, new ways of communicating with other customers or managing the review process on social media, all require associated technology changes. An example of how changes to the product offer are reflected through changes in technology and business process is the development of the Strava product offer.

Strava uses segments to compare an athlete with other athletes over the same section of a cycling route or running course. This is fine for elite athletes, who tended to be early adopters of the service, because they are at or near the top of the list. But for a club athlete, or social runner, it is not so encouraging to be scored as being in the top 5,000 of other athletes who have already completed a popular segment. No matter how hard a social runner competes, they are never, ever going to get anywhere near to the top of a complete list of other cyclists or runners for a particular segment, which goes against the *raison d'être* of the company, which is to encourage and entertain athletes.

For this reason, the company introduced a filtering process so that individuals can compare themselves against similar athletes. A runner can compare themselves to runners in the same age bracket, weight, level of training, type of bike, gender or whatever, and the inducement of competition can then become an encouraging factor rather than a demotivating one. This filtering process depends entirely on software enhancements, as do almost all new features. In fact, the analysis and interpretation of the data is now such an important facet of Strava, that the company features Strava labs in its marketing, to showcase the power of data from a large community of athletes, e.g. see the global heat map example (<https://labs.strava.com/heatmap/>).

#### ***2.4.6 All companies are or will become technology companies***

To an extent, all companies are technology companies. The idea is an extension of one proposed by David Pottruck, former CEO of Schwab.com. Schwab.com was a leader in online trading during the dot com boom, and technology was at the heart of its operations. Pottruck stated that every single employee should be a part-time technologist. This was regardless of their functional title or position.

In the current environment, this idea has become more important as technology is more embedded in the fabric of organizations and market networks. This means that outsourcing of technology and technology staff needs to be approached with extreme care because a company's management team risks abdicating responsibility for technology management and therefore surrendering part of its business. Of course, the new sharing economy companies such as Uber and Airbnb, and the technology giants Taobao, Amazon and Google, may be extreme cases, but the logic still holds for all types of companies. Perhaps the term 'outsourcing' is simply too problematic and rather than thinking of technology as something that can be separated out from the business, managers should think in terms of partnerships where the focus of attention is on managing the technology in the context of the business model.

#### ***2.4.7 Business models must evolve and adapt***

There is a risk when managers start to talk about their organizations as a 'business model' because the logic of the model becomes so enticing and attractive that it become difficult to challenge or question it. That is, managers become so wrapped up in their current success that they fail to recognize or anticipate changes to their market, technology and competition. For



an external change to register an impact on an organization, its management must go through a series of hurdles: anticipate or recognize the change, understand it, work out its consequences and then make an appropriate reaction. In the case of TESCO, it appeared to have an unsailable position as the UK's leading grocery firm because of its scale, its novel use of customer loyalty card data, its control over building lands for new stores, and the strong financial position gained from positive cash flow because customers paid immediately and suppliers were paid months later. The culmination of TESCO's business model logic was to build enormous stores with space for electrical goods and clothes, as well as a huge range of food items.

Several changes occurred together that had a competitive impact. The online channel grew in importance and customers started to order bulky items online and then started to shop for other food items as more of a leisure activity or last minute chore. This made visits to a large out of store shop much less attractive and convenience stores grew in importance. Value or discount retailers came to the fore, especially Aldi and Lidl, challenging the price advantage of TESCO by focusing on a smaller range of goods and lower levels of customer service. The sale of electrical items through physical retail stores was decimated by the onslaught of online competition. In a relatively short period of time, the large mega-stores became white elephants, and the company scrambled to figure out how to utilize the unwanted and unneeded space.

Vitality insurance is an excellent example of an existing and established company that has transformed its business model from a traditional insurer to a behavioural ecosystem where the customer is at the centre of the ecosystem [32] and Vitality's business role changes to being a pro-active provider of health and fitness feedback that is designed to motivate the customer to make healthier choices that will logically lead to a reduction in medical expenses and insurance premiums.

Static business models have a natural lifetime and do not last forever. By formulating business model logic, it sometimes becomes difficult to question, let alone change and adapt an existing business model, vide Tesco. Self-awareness and self-criticism should be built into the culture of the company, even if it cannot be specified in the governance. Technology partners can play a crucial role here because of their external focus, with the caveat that they are not already embroiled in existing IT infrastructures.

A related issue is that a single business model often oversimplifies a company's strategy and how it is changing to survive and grow. Managers should therefore think in terms of multiple business models and be clear about whether they can operate separately, or need to work in conjunction with each other. This may reflect distinctive lines of business, i.e. separate products, or it may reflect different aspects of a market in which the company has several roles. For example, in the mobile phone market, the shift towards bundled products that combine fast home Internet connection, mobile phones and entertainment packages means that companies such as Telefonica, T-Mobile and Vodafone must also have business models that define them as entertainment companies in addition to their positions as telecommunications businesses.

The example of telecommunications companies becoming entertainment companies is a good illustration of the more general phenomenon of strategic transitions between eras that are defined by technological change. The car industry came out of the horse-and-carriage business, and both are perhaps better described as transportation businesses. The technologies in Table 2.1 are at the heart of Ford's stated strategy to become an operating system for transportation, which is an even more general business model that gives them freedom to innovate far beyond the confines of a traditional automotive company and to take advantage of revolutionary technology that is disrupting consumer behaviour and expectations towards mobility and transportation.

## 2.5 Implications for technology strategy and partnerships

Commentators tend to focus on what is new, i.e. the technology in Table 2.1, and largely ignore mature and stable technology that exists within established legacy businesses. The term ‘legacy business model’ is used to describe established business models, often with significant assets and legacy information systems, which may have significant market share and be financially successful. For example, retail banks, chemical companies, traditional car manufacturing and high-street grocery firms operate legacy business models that utilize a large amount of stable technology such as enterprise systems, e-commerce standards, simple tracking technology using barcodes and management reporting based on ‘little’ data. In addition, they will be exploiting new forms of technology that are changing more rapidly but overall legacy business models utilize a large amount of legacy technology, and this should be managed quite differently from the new and rapidly changing technology. Likewise, new forms of business models are built mainly around new technology, and will also use stable technology though with a much greater focus on business innovation and novel technology. The dilemma for legacy business models has been discussed widely in the business literature [33]. The debate here therefore focuses on the implications of stable and fast-changing technology on technology strategy and partnerships.

### *2.5.1 Proposed model and managerial implications for technology strategy and outsourcing*

For stable technologies the emphasis should be on risk reduction, cost efficiencies and high quality of service delivery. More traditional outsourcing arrangements may work in this context with the caveat that the company should retain enough intelligence and capability to monitor the performance of contracts and be aware of any new developments that may create new types of change, e.g. the shift to Cloud computing for ERP and CRM systems. For new and emerging technologies, the emphasis should be on experimentation, flexibility, multiple partnerships with external companies, relatively small teams of exceptional staff and of course a willingness to accept failure and move on quickly.

The influence of stable and new/emerging technology on technology strategy and partnerships is shown in Figure 2.1. New/emerging technology is linked to innovative business models, and legacy systems management are linked to legacy business models. Note that in practice legacy business models will also try and incorporate new forms of technology, and that innovative business models will also incorporate elements of stable technologies such as enterprise systems. A good way of conceptualizing this mix of technologies, and the need for multiple technology strategies, is to think of a company as having multiple business models.

For legacy companies, this often leads to tensions and conflicts between different areas of the business, because the new business model is seen as cannibalizing or stealing customers from the legacy business model, vide online sales for high-street retailers, and novel forms of lending versus established lending models for legacy banks. However, the main use of the diagram is to illustrate the clear need to develop specific technology strategy and partnerships for each category of technology.

New and innovative business models illustrate the need for flexibility and speed, and legacy business models emphasize the need for stability, risk reduction and careful technology cost management. The tension between new and legacy business models is therefore not only in the design of the business model, but in the approach to the management of technology, which creates challenges for established companies wishing to transform themselves, e.g. Ford moving from a manufacturer of cars to a transport operating system, and for new business modes such as Uber and Strava, that some of their technology should be treated as routine and managed accordingly.

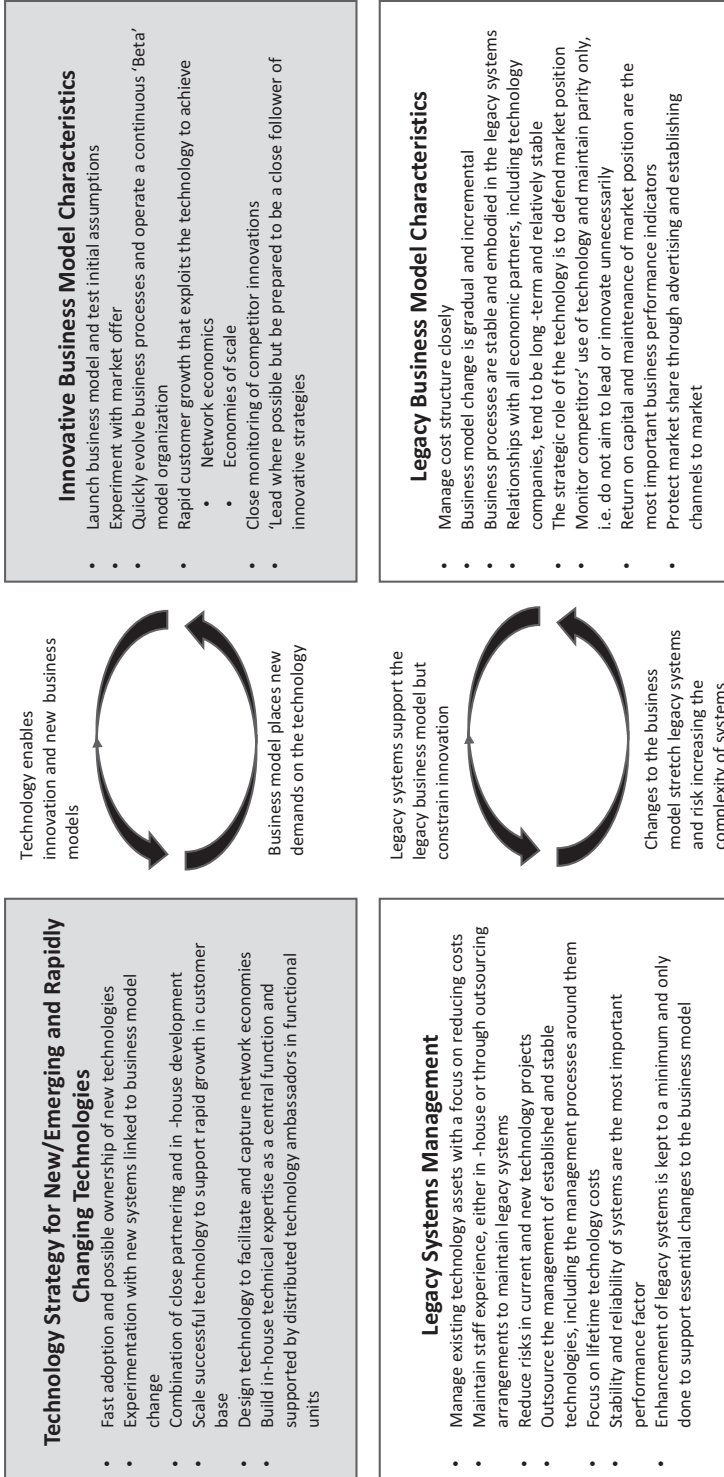


Figure 2.1 Coherence of new/emerging technology, innovative business models, and legacy systems management and legacy business models

## 2.6 Conclusion

If the ideas in this chapter are developed to their natural conclusion, one reaches the view that the value of modern company is represented by the nexus of its intellectual property, information assets, technology capabilities and partnerships (Jensen and Meckling 1976). Partnerships with external technology companies must therefore be highly collaborative and capable of mutual adaptation and change, especially in the context of new/emerging technology (Whitley and Willcocks 2011).

Of course, physical assets still matter to many organizations, but when comparing Airbnb with Hilton, Strava with a sportswear company or a bank with a peer-to-peer lending company, the traditional financial measures of success, i.e. the size of balance sheets, profit and loss accounts, are no longer sufficient. To capture the value that is generated by a new business model such as Uber, Strava or Amazon, it is necessary to evaluate them in terms of a range of variables, many of them non-financial, for example information assets, technology, social capital, network links and analytical capabilities.

In this context of (1) new/emerging and therefore rapidly changing technology, and (2) stable and mature technology, companies must develop strategies that can cope with both of these modes of technology strategy, and these are outlined in Figure 2.1. This is difficult to achieve because the skill sets and philosophy of close cost control, risk reduction and consolidation of legacy systems are in sharp contrast to those required for experimentation, rapid and continuous change, with close iterations between the evolving business model and the new technology.

For new and innovative business models, companies must develop and retain staff with high levels of technology skills and capabilities and be able to integrate this expertise with entrepreneurial managers in order to build and grow novel business models. For legacy businesses, it is likely that they will need a combination of skills to maintain and carefully adapt legacy systems, and simultaneously manage new technologies in order to build new business models or transform legacy business models into completely different enterprises. One size of technology strategy and partnership certainly does not fit all types of business model and technology.

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