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The New Normal

Competitive advantage in the digital economy

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The Big Innovation Centre is an initiative of The Work Foundation and Lancaster University. Launched in September 2011, it brings together a range of companies, trusts, universities and public bodies to research and propose practical reforms with the ambition of making the UK a global open innovation hub as part of the urgent task of rebalancing and growing the UK economy, and with the vision of building a world-class innovation and investment ecosystem by 2025. For further details, please visit www.biginnovationcentre.com.

Executive summary

The digital economy, spurred on by recent advances in information and communication technologies and the internet, has brought disruptive forces to the fore and created a new normal in which firms compete. These, while presenting firms with new ways to create, deliver and capture value, have also wrong-footed many firms that have either been slow to adapt or failed to grasp the new keys that can unlock growth. The digital economy is about much more than just e-commerce and web-based pure-plays; it affects almost every firm, sector and industry in the real economy.

Radical change in the environment requires radical response. Firms have relied for too long on familiar and tangible sources of value creation to drive competitiveness. In the new normal, however, firms can no longer compete simply on the basis of greater access to and efficiency of traditional factors of production, ie land, raw materials, labour and capital, or clever strategies that revolve around these. For firms seeking to grow and thrive in the digital economy, the name of the new game is **intangibility**.

This paper offers thought leadership in the areas of strategy, innovation and competitiveness. It highlights why conventional strategic approaches alone will not serve firms well in the digital economy. By setting out a new paradigm for value creation, it provides business leaders and executives with a **new framework for strategic planning** relevant for the digital age. Today's business leaders, executives and policy-makers must take cognizance of the following:

- The real sources of value creation and competitive advantage in the digital economy lie in fluid and constantly evolving **intangibles** such as *firm strategy and positioning, radical innovation and first mover advantages, intangible resources and competencies, organisational ambidexterity, network effects and externalities, transaction cost efficiency, and relational optimality*. These are the dynamic 'factors' of the digital economy, and must be harnessed in addition to the conventional factors of production if firms seek to not just survive but also thrive in the new normal.
- These seven intangible sources of competitive advantage are in effect interconnected and complementary. The manifest value of these can be found in their **complementarities**, and sustainable competitiveness in the synergistic effects obtained from harnessing these sources collectively. It is about strategically combining several or all of these intangibles to create new value and drive business model innovation. This implies that smart configurations of these sources in ways appropriate to the firm's industry and line of business are capable of helping the firm gain and sustain competitive advantage.

- The complementarities of these intangible sources demand a new approach to strategic planning. Business leaders and executives must adopt an **'ecosystem paradigm'** of competitive advantage in formulating business strategy and reinventing business models. This refers to the need to take a holistic view of all seven intangible sources and consider how, as intricately-linked components of an ecosystem, they might combine to strategically complement each other. As this paradigm represents a departure from conventional thinking, it is capable of helping firms differentiate themselves from competitors and sharpen their competitive edge.
- However, the path to competitiveness in the digital economy remains treacherous. The various possible configurations of these seven intangible sources also imply that complementarities can emerge in different forms and ways. Just as there is no silver bullet or a single highway to success, many are the paths to failure and oblivion. This necessitates, to a lesser or greater extent, the **reinvention of business models** at some point in the evolution of the markets where a firm competes. As market dynamics change, firms must either reactively ensure their business models are at least capable of keeping up or proactively innovate their business models to create new markets altogether.

Going forward, this new strategic framework will also provide a useful platform for future joint-research with Big Innovation Centre partners leading to the development of a modern taxonomy of new business model drivers in today's digital economy, taking into account differences that occur in various industries and sectors. Such taxonomy will break a path in hitherto uncharted territory in both academic and practitioner-orientated literature, and will therefore provide further cutting-edge thought leadership. More importantly, the learning derived from this forthcoming joint-research will also help businesses identify how they might practically reinvent their business models to compete more effectively.

The myriad of strategic factors that warrant serious consideration in the new normal are substantially different from the traditional industry-shaping competitive forces that business schools have taught today's executives. In simple terms, old tricks are no longer adequate. Firms not only need to learn new ones, but also acquire the whole breadth of them, as they work best in concert.

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1. Introduction: Unlocking growth in the new normal

The integration of information and communication technologies (ICT) and digitisation into organisations and their business practices has radically changed the dynamics of competition among firms. This has also meant that opportunities for enhancing firm competitiveness have increased in depth and scope, as have challenges and threats to the viability of incumbent businesses and tried-and-tested practices. The digital economy, spurred on by recent advances in the internet and the web and the rapidly declining costs of computing, has brought disruptive forces and technologies to the fore. These, while presenting firms with new ways to create, deliver and capture value, have also wrong-footed many firms that have been slow to adapt. Business models are constantly being reinvented, while industries and standards are undergoing radical transformation.

This paper highlights why conventional approaches alone to strategy and competitiveness will not serve firms well in the digital economy, and provides business leaders and executives with a new framework for strategic planning. This framework is particularly relevant for the digital age, where the internet and e-business have changed the competitive imperatives for today's firms. This framework is unique in that it is based on an 'ecosystem paradigm' of competitive advantage that adopts a holistic view of strategic options. This paradigm is built on a systematic exposition of the **intangible sources of competitive advantage** so crucial for firms aiming to not just survive but also thrive in the digital age. As this paradigm represents a departure from conventional thinking, tapping into these sources will enable firms to differentiate themselves from competitors and sharpen their competitive edge.

Viewing competition in the digital economy from the perspective of an ecosystem of intangibles is important for helping firms realise that the changing game requires a very different response and whole new approach to strategic planning. The myriad of strategic factors that warrant serious consideration are substantially different from the traditional industry-shaping competitive forces that business schools have taught today's executives. In simple terms, old tricks are no longer adequate. Firms not only need to learn new ones, but also acquire the whole breadth of them, as they work best in concert. This new framework can therefore be a useful tool that complements the existing array of strategic planning techniques in the executive's toolbox.

Going forward, this framework will also provide a useful platform for further research leading to the development of a modern taxonomy of new business model drivers in today's digital economy, taking into account differences that occur in various industries and sectors. This is important for deepening our understanding of the changing competitive dynamics of different sectors, the emergence of innovative business models as a strategic response, and how policy can best facilitate innovation and the growth of new business models.

Welcome to the new normal

Most people wishing to sell things online a little more than a decade ago would typically flock to local online forums to advertise their offerings. The expansion of the web and internet penetration worldwide has made auction sites like eBay, WebStore and eBid the platforms of choice for individuals trading goods and services online. Some small and medium-sized enterprises (SMEs) have latched on to these sites to augment the online trading conducted via their own websites. Advances in digital photography has consigned the 35mm film to history and sounded the death knell for the traditional camera, and given rise to a whole new chain of value creation activities. Dell has been able to bypass intermediaries by selling directly to customers and allowing them to configure the product online, a move that has since been replicated by other computer manufacturers. Likewise, low cost airlines have shown it is possible to eliminate the need for agents to sell tickets.

The intense pace of change in the digital economy – technological, industrial, social and consumer-driven – has also left some firms floundering. Eastman Kodak, despite being a pioneer, strangely missed the digital photography bandwagon, and has now filed for bankruptcy. The smartphone revolution passed Nokia by, causing it to plunge from being a market leader to trailing behind Apple and Samsung. BlackBerry (previously known as Research in Motion), too, has fallen behind, and its future now hinges on its recently released BB10 operating system and a string of new phones. IBM was forced to reinvent itself by selling off its hardware business and refocusing on services, software and solutions. Dell has reverted to private ownership in a bid to arrest its decline as the heydays of its direct business model seem to be well and truly over.

These examples, besides illustrating how business models, ie the way business is done, have changed, also imply an important but often overlooked aspect of the digital economy. The digital economy is certainly about much more than just web-based firms – also called ‘pure-plays’ – making money solely on web-based content. It is also more than just e-commerce. In other words, the digital economy must not be conflated with the virtual economy – the latter is a subset of the former. The reality is that the digital economy affects almost every firm, sector and industry in the real economy. The pervasiveness of ICT and the internet means that many firms, regardless of their size, participate in one way or another, to a lesser or greater extent, in the digital economy.

Whether they know it or not, many firms today are in effect e-businesses. They do not just conduct at least some of their business electronically, but many of their back-end-processes, production and marketing activities, too, have adopted some form of digitisation.¹ As an integral part of the digital economy, e-business essentially includes all manners of doing business electronically. This view of e-business is sufficiently wide to cover activities such as research and development, procurement, manufacturing/production, marketing, sales, trading and customer service. While brick-and-mortar defined the old economy, click-and-mortar is the new norm. Even the village toy shop is increasingly eschewing the fax machine in favour of the email; many of them can now even boast of having a presence on the web.

¹ The Department of Trade and Industry defines e-business as: “when a business has fully integrated ICT into its operations, potentially redesigning its business processes around ICT or completely reinventing its business model ... e-business, is understood to be the integration of all these activities with the internal process of a business through ICT”. See Department for Trade and Industry (2004), *Achieving Best Practice in Your Business: An Introduction to E-business*, available at <http://www.dti.gov.uk/bestpractice/assets/internet.pdf>, accessed on 28 Aug 2012.

The digital economy and its implications

The digital revolution is only just gathering pace (see Table 1), fuelled in large part by the penetration and convergence of digital technologies. While computers and mobile phones are now ubiquitous, smartphones are well on their way to overtaking feature mobile phones and tablets are fast gaining popularity. About 40% of adults in the UK now own a smartphone, while tablet ownership has increased from 2% to 11% in the last year alone. Over half (52%) of all call volumes are now made from a mobile phone as the average cost of a mobile voice call has now fallen to broadly the same level as a fixed line call. 80% of the UK population now have access to the internet and some 37% of UK adults with home internet watch catch-up television online. In tandem with these figures, it is hardly surprising that web advertising spend is now greater than any other advertising category.²

Table 1: The internet and web-based content market in the UK, 2007-2012

	2007	2008	2009	2010	2011	2012
PC/laptop take-up (%)	71	72	74	76	78	79
Internet take-up (%)	64	67	73	75	77	80
Total broadband take-up (%)	52	58	68	71	74	76
Fixed broadband take-up (%)	n/a	n/a	68	71	67	72
Mobile broadband take-up (%)	n/a	n/a	12	15	17	13
Internet on mobile-phone take-up (%)	n/a	n/a	20	21	32	39
Social networking online take-up (%)	n/a	20	30	40	46	52
Internet advertising expenditure (£)	2.8bn	3.4bn	3.5bn	4.1bn	4.8bn	n/a
Mobile advertising revenue (£)	n/a	29m	38m	83m	203m	n/a

Source: Ofcom (2012), *Communications Market Report 2012*, London: Office of Communications.

But advances in ICT and the internet that made possible the digital revolution have also created a whole new set of conundrums for firms in a variety of industries where digitisation has changed the way value can be created, delivered and captured. The increasing popularity of e-readers and tablets means meeting the demand for digital content has created pressure on publishers to perform new activities, link these activities in ways that are valuable to the customer, and build new partnerships for production or distribution.³ Music recording companies have been forced to rethink their business models and the way they compete in an era of free (but not necessarily legal) music download and P2P file-sharing.⁴ High street retailers are constantly looking at how they can make better and more efficient use of their presence on the web in the face of competition from the more nimble online-only retailers. Eager to capture the opportunities afforded by big data and advanced analytics, pharmaceutical firms are exploring ways in which they can join forces by sharing data to co-develop

² Ofcom (2012), *Communications Market Report 2012*, London: Office of Communications.

³ These are described in terms of a business model's activity 'content', 'structure' and 'governance'. See Amit, R. and Zott, C. (2001), "Value creation in e-business", *Strategic Management Journal*, 22(6-7): 493-520; and Amit, R. and Zott, C. (2012), "Creating value through business model innovation", *MIT Sloan Management Review*, 53(3): 41-9.

⁴ Free music download and P2P file-sharing may not necessarily be a bane for the music industry, as the potential upsides from the resulting market creation and market segmentation effects may outweigh the potential downsides of market substitution. What this implies, though, is the need for an appropriate business model to capture these positive effects. See Andersen, B. and Frenz, M. (2007), *The Impact of Music Downloads and P2P File-Sharing on the Purchase of Music: A Study for Industry Canada*, available at [http://www.ic.gc.ca/eic/site/ippd-dppi.nsf/vwapj/IndustryCanadaPaperMay4_2007_en.pdf/\\$FILE/IndustryCanadaPaperMay4_2007_en.pdf](http://www.ic.gc.ca/eic/site/ippd-dppi.nsf/vwapj/IndustryCanadaPaperMay4_2007_en.pdf/$FILE/IndustryCanadaPaperMay4_2007_en.pdf), accessed on 16 Aug 2012.

treatments, while insurance firms also seek to do likewise to help detect potentially fraudulent claims.⁵

However, it is crucial for firms to understand that reinventing the way they create, deliver and capture value will not by itself create competitive advantage. Instead, a new or improved business model harnesses the potential of a number of interconnected sources of value to generate higher returns. Traditionally these sources have been understood to be the factors of production – land, raw materials, labour and capital. The ownership of these and the way they are configured may result in business models capable of delivering a competitive edge.

While few would argue against the benefits of cost savings and productivity accrued by digitisation on these conventional factors, firms can no longer compete simply on the basis of greater access to and efficiency of these tangible traditional factors. For firms seeking to grow and thrive in the digital economy, the name of the game is **intangibility**. Although tangible factors are still necessary and remain an integral part of production, the real sources of value creation and competitive advantage lie in fluid and constantly evolving intangibles such as *firm strategy and positioning, radical innovation and first mover advantages, intangible resources and competencies, organisational ambidexterity, network effects and externalities, transaction cost efficiency, and relational optimality* (see Figure 1). These are the dynamic ‘factors’ of our time, and are important for both manufacturing and services firms in terms of firm competitiveness, sustainable performance, market share and technological advantage.

What is increasingly capturing the attention of business leaders, policy-makers and academics is the fact that advances in ICT and digitisation have, in unprecedented ways, created gilt-edged opportunities for the creation and exploitation of such intangible resources. For instance, the doubling of modern computing power approximately every 18 months⁶ has allowed firms to harness the power and potential of data analytics for a differentiation strategy and for spawning innovative products and services. Firms using data analytics to differentiate themselves from competitors are twice as likely to be top performers as lower performers.⁷ Capital One, a Fortune 500 financial services institution, uses analytics to continuously experiment with innovative combinations of customer segments and new products.

Research has suggested that the increasing digitisation of economic activities has improved the detailed measurement of business activities (which aids better *strategy* formulation and *positioning*), enabled faster and cheaper experimentation (which fosters *organisational ambidexterity* and increases the likelihood of spawning *innovations*), facilitated the easier sharing of observations and ideas (which allows for the capturing of insights and *learning* from *network* members), and increased the ability to replicate innovations more quickly (which improves *transaction cost efficiency*).⁸

⁵ For some of the trends emerging from the application of advanced analytics on big data, see Wong, D. (2012), *Data is the Next Frontier, Analytics the New Tool: Five Trends in Big Data and Analytics, and Their Implications for Innovation and Organisations*, London: Big Innovation Centre.

⁶ This is based on Moore’s law, which is now somewhat a truism in the computer industry. Intel co-founder Gordon Moore first observed that transistors on a chip would double every year, before recalibrating it in 1975 to every two years. David House, a then Intel executive, noted that this would cause computing performance to double every 18 months. See Moore, G.E. (1965), “Cramming more components onto integrated circuits”, *Electronics*, 38(8): 114-7.

⁷ LaValle, S., Hopkins, M.S., Lesser, E., Shockley, R., and Kruschwitz, N. (2010), “Analytics: The new path to value”, *MIT Sloan Management Review*, Fall.

⁸ Brynjolfsson, E. (2011), “ICT, innovation and the e-economy”, *European Investment Bank Papers*, 16(2): 60-76.

Figure 1: The intangible sources of competitive advantage in the digital economy*



* See Table 2 for a more detailed framework for strategic planning.

However, to paint the digital economy all pink and rosy would be misleading. E-business itself raises a range of new strategic questions for firms and presents a host of new leadership challenges. There are as many, if not more, losers and strugglers as there are winners in the digital economy. Failure to grasp and exploit these new sources of competitive advantage may explain why some firms struggle to make money online and others fail to sustain their market leadership. Fundamental to determining whether firms sink or swim in the digital economy is how well they are able to grasp its implications on the way business will be done in the future and, in the light of this, whether they are capable of creating and exploiting the intangible 'factors' to reinvent their business models.

2. Intangible sources of competitive advantage in the digital economy

Many firms find competition in the digital economy rather intensive and making money on the internet particularly challenging.⁹ While this may be slightly more pronounced for firms making a living developing content for the web, click-and-mortars that also sell their products and services online are not insulated from these challenges either. The heart of the problem is that industry and market dynamics in the digital economy, in addition to the nature of the digital economy itself, create certain features that have intensified competition and rendered rent-seeking difficult.

The digital economy is characterised by high connectivity and a wide reach, which enable people, products and services from different and multiple geographies to be connected quickly and almost effortlessly.¹⁰ It is also characterised by not just the amount but also the richness and depth of information that can be accumulated, offered and exchanged.¹¹ While the 'exchange' is mainly focused on transactions,¹² the nature of transactions itself places greater salience on information goods and networks.¹³ This leads to two important effects – the emergence of virtual communities that are able to share information among themselves and with firms,¹⁴ and the disintegration of the traditional value chain, as intermediaries, for instance travel agents, become redundant.¹⁵

Consider all these in addition to the ease of extending the firm's product or service range, the ability to customise products and services in real-time, the ease of access to technological assets, the capability to abstract and process big data to glean insights for better decision-making, and the possibility of forming new and novel partnerships and alliances with suppliers, competitors and even customers – and one will realise the complexity of change presented by the digital economy can leave firms at best flustered and at worst struggling just to keep pace. No wonder those that obstinately cling on to traditional, time-tested practices and business models find their competitive advantage slipping away. This calls for firms to consider the strategic incentives and opportunities that drive business uptake of ICT and digital technologies, and, inevitably, to rethink where the sources of competitive advantage lie.

⁹ Soon after launching in September 2011, the Big Innovation Centre hosted a thought-provoking debate at Google where the discussion on how we should pay for the Internet often highlighted the conflicting relationships and inherently different objectives between producers, providers and users. See Sissons, A. (2011), *The Big Digital Dilemma: How Should We Pay for the Web?* London: Big Innovation Centre.

¹⁰ Dutta, S. and Segev, A. (1999), "Business transformation on the Internet", *European Management Journal*, 17: 466-76.

¹¹ Evans, P.B. and Wurster, T.S. (1999), *Blown to Bits: How the New Economics of Information Transforms Strategy*, Boston, MA: Harvard Business School Press.

¹² Balakrishnan, A., Kumara, S.R.T. and Sundaresan, S. (1999), "Manufacturing in the digital age: Exploiting information technologies for product realization", *Information Systems Frontier*, 1: 25-50.

¹³ Shapiro, C. and Varian, H.R. (1999), *Information Rules: A Strategic Guide to the Network Economy*, Boston, MA: Harvard Business School Press.

¹⁴ Hagel, J. III and Armstrong, A.G. (1997), *Net Gain: Expanding Markets through Virtual Communities*, Boston, MA: Harvard Business School Press.

¹⁵ Sampler, J.L. (1998), "Redefining industry structure for the information age", *Strategic Management Journal*, 19(4): 343-55.

While an earlier seminal research has explored some of these sources of competitive advantage – referred to as a collection of received theories of firm competitiveness – and proposed a new four-item typology of the sources of value creation in e-business,¹⁶ this paper provides a wider and more emancipated discussion of the sources of firm competitiveness that are **intangible** and relevant to the **digital economy**, which, as emphasised above, transcends e-business.

The resulting new framework for strategic planning, as represented by a typology of sources of competitive advantage (see Table 2), highlights a brutal reality of competition in the digital economy where change is the only constant: just as there is no silver bullet or a single highway to success, many are the paths to failure and oblivion. Firms have always battled for survival even long before and during the fledgling years of the digital economy. A study of large firms across four decades shows that only 160 of 1,008 survived between 1962 and 1998.¹⁷ Another large scale study involving more than 6 million American firms suggests that only a small fraction of firms, less than 0.1%, live to age 40.¹⁸ Start-ups have fared no better. A study using ten-year data shows only 29% of single-establishment start-ups in 1992 were still alive a decade later.¹⁹ It is likely that any study of firm mortality by the end of this digital decade will reveal that firms are increasingly challenged for survival.

In the light of this, the Big Innovation Centre has proposed an innovation ecosystem approach to understanding innovation in the digital age, with implications for policy, practice and research.²⁰ Drawing on a similar approach, this paper seeks to add to the understanding of competitive advantage in the digital economy by highlighting the multiple, complementary and interconnected sources of value creation that underpin innovative business models and competitive dynamics.

¹⁶ Raphael Amit and Christoph Zott propose novelty, efficiency, complementarities and lock-in as four value creation sources in e-business. See Amit, R. and Zott, C. (2001), *op. cit.*

¹⁷ Foster, R. and Kaplan, S. (2001), *Creative Destruction*, New York, NY: Currency.

¹⁸ Stubbart, C.I. and Knight, M.B. (2006), "The case of the disappearing firms: Empirical evidence and implications", *Journal of Organizational Behavior*, 27(1): 79-100.

¹⁹ Shane, S.A. (2008), *The Illusions of Entrepreneurship: The Costly Myths That Entrepreneurs, Investors, and Policy Makers Live By*, New Haven, CT: Yale University Press.

²⁰ See Andersen, B., Brinkley, I. and Hutton, W. (2011), *Making the UK a Global Innovation Hub: How Business, Finance and an Enterprising State Can Transform the UK*, London: Big Innovation Centre.

Table 2: A framework for strategic planning: typology of intangible sources of competitive advantage in the digital economy

Where competitiveness resides (unit of analysis)	Intangible source of firm competitiveness	Key features	Opportunities / challenges	Seminal literature
Industry structure, markets and value chain	Firm strategy and positioning	<ul style="list-style-type: none"> • High barriers to entry and substitution • Strong bargaining power vis-à-vis suppliers and customers • Differentiated products and services 	<ul style="list-style-type: none"> • Market share, brand leadership, superior value • Price wars, online deathtraps, e-commerce saturation 	Porter, 1980, 1985, 1996, 2001
The firm, processes and the entrepreneur/leadership	Radical innovation and first mover advantages	<ul style="list-style-type: none"> • New technological trajectories • New and novel products and services • New and novel business models • Intellectual property rights 	<ul style="list-style-type: none"> • Dominant market position, dominant technological trajectories, market skimming, head-start rents • First mover's curse, aggressive close followers, suboptimal IPR regimes 	Schumpeter, 1934, 1939, 1942; Amit and Zott, 2001
Firm-specific resources	Intangible resources and competencies	<ul style="list-style-type: none"> • Valuable, rare, inimitable, non-substitutable resources • Strong intellectual capital • Dominant brands • Unique institutionalised competencies • Strong and effective culture 	<ul style="list-style-type: none"> • Knowledge acquisition and learning, rents created from difficult to copy capabilities, comparative advantages • Mobility and flight of resources • Open resources (non-ownership) trend 	Penrose, 1959; Wernerfelt, 1984; Barney, 1991; Peteraf, 1993
Dynamic capabilities	Organisational ambidexterity	<ul style="list-style-type: none"> • Flexibility and agility • Quick reconfiguration of resources • Management of paradoxes and conflicting priorities 	<ul style="list-style-type: none"> • Novelty of products, services, ventures and business models; uncharted territories; reinvention • False ambidexterity, demand on scarce resources 	Teece, Pisano and Shuen, 1997; Teece and Pisano, 1994; O'Reilly and Tushman, 2008
Strategic networks	Network effects and externalities	<ul style="list-style-type: none"> • Network externalities (scale) • Path dependency • Lock-in and repeat purchase • Complementarities • Inter-firm ties 	<ul style="list-style-type: none"> • Market stranglehold (when leading), exponential profits, dominant technological trajectories • Market stranglehold (when chasing), winner-takes-all profit glass ceiling 	Katz and Shapiro, 1985; Economides, 1996; Liebowitz and Margolis, 1995; Arthur, 1988, 2009; Dyer and Singh, 1998
Firm transactions	Transaction cost efficiency	<ul style="list-style-type: none"> • Cost reduction in planning, adapting, executing and monitoring tasks • Efficient processes and forms of governance 	<ul style="list-style-type: none"> • Cost efficiency, cost leadership, superior value, undercut prices • Complex networks hike costs back door 	Coase, 1937; Williamson, 1975, 1983
Intra- and extra-firm relationships	Relational optimality	<ul style="list-style-type: none"> • Optimisation of directness, commonality, multiplexity, parity and continuity • Building social capital • Harnessing the strength of weak ties 	<ul style="list-style-type: none"> • High productivity, open innovation, well functioning collaborative networks • Relationships are complex and subjective, optimising is subjective 	Schluter and Lee, 1993, 2009; Palmatier, Dant and Grewal, 2007; Bourdieu, 1986; Putnam, 2000; Granovetter, 1973, 1983

Firm strategy and positioning

Executives well schooled in Porterian competitive advantage hold strongly to the mantra that firm competitiveness comes from actions to create defensible positions against competitors²¹ and from strategically configuring the value chain to create superior value for customers.²² The former refers to the creation of economic rents by engaging in strategic investment and positioning to fend off competitive forces – competitors, suppliers, customers, substitutes and potential new entrants – that tend to drive economic returns down. The latter refers to creating value by differentiation along every level of the value chain, resulting in products or services that lower buyers' costs or raise buyers' performance, or satisfaction.

The interconnectedness of a firm's value chain and the firm's ability to take on the competitive forces in the market means that strategic positioning assumes added importance in the digital economy, not least because, as discussed above, the inherent characteristics of the digital economy create as many opportunities to succeed as to fail. Rising costs of operating on the high street and intense price competition have only been worsened by some of the consequences of the digital economy such as the lowering of entry barriers due to the decreasing need for physical assets and the increase in consumers' bargaining power thanks to online search engines and price comparison sites.

These have contrived to push many firms onto the online marketplace, with some forced to reposition themselves as e-tailers by closing their high street operations. Dixons, the electronics and electricals retailer, disappeared from the high street in 2006 after almost 70 years to become an exclusively online player, with its physical stores being absorbed into the Currys.digital brand under the same parent.²³ With the benefit of hindsight, it is now arguable that had it not repositioned itself then it might have been buried alive under the weight of cut-throat competition posed by the likes of Amazon and other e-tailers. Its rival Comet soon discovered it was impossible to survive as a click-and-mortar in consumer electronics. Failure to reposition itself led to its eventual demise.

But the online marketplace isn't a goldmine either, as many firms have discovered. Despite the precious lessons learned from the dotcom boom and bust at the turn of the century, firms operating online with the conviction that they could position themselves more effectively to reach a wider segment of consumers, too, have found life tough. La Redoute, the French mail order and online retailer, for example, suffered a decline in traditional mail order that had not been sufficiently offset by growth in online sales. In the face of intense competition and downward pressures on retail prices, La Redoute was forced to launch a project to restore its competitiveness by reconfiguring its value chain and adapting its business model to develop more innovative products, build closer relationship with customers and better

²¹ Porter, M.E. (1980), *Competitive Strategy*, New York, NY: Free Press.

²² Porter, M.E. (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*, New York, NY: Free Press.

²³ See "Dixons quits the high street after 70 years and moves from retail to e-tail", *The Guardian Online*, 6 Apr 2006, available at <http://www.guardian.co.uk/business/2006/apr/06/highstreetretailers.marketingandpr>, accessed on 3 Sept 2012.

respond to customer needs.²⁴

For many brick-and-mortars, though, joining the online marketplace represents a sensible extension to their business and hardly a major shift in terms of well established practices. Major retailers and supermarkets like Marks and Spencer, John Lewis, Tesco and Sainsbury reap important synergies between their online and traditional store operations. The complementarities forged can have significant positive impact on the firm's value chain, and are something that pure-plays, or e-tailers, find difficult, if at all possible, to replicate. For instance, direct online ordering forces retailers to beef up the efficiency of their inventory system, warehousing facility and shipping operations, all of which can have positive spill-over effects on their store operations.

Against a backdrop of ferocious competition where only the fittest and most adaptable are able to survive, the competitive imperative for firms in the digital economy is to reposition themselves differently to competitors. This is partly to stand out in an increasingly crowded and noisy marketplace, and partly to offer customers distinctive value for which they have good reasons to transact with the firm (and not its competitors). While price differentiation may yield some very quick short-term gains, any advantage is unlikely to be sustainable as competitors can quickly follow by slashing prices, hence potentially triggering a price war – and a race to the bottom. Firms in the digital economy, particularly those competing online, have come to accept this, and realise that other value drivers hold the key to more effective differentiation.²⁵ South Korean electronics giant Samsung was once a manufacturer of products that were simply cheaper than rivals Sony's and Panasonic's. But a strategic repositioning to focus on much higher quality has helped Samsung to become the brand that it is today, whose products are closely associated with cutting-edge innovation and attractive design.

Positioning to differentiate a firm's value chain as a strategy to fend off competitive forces of the market can come in two ways.²⁶ A firm can configure its value chain to undertake completely different activities from competitors'. Moving exclusively online to become an e-tailer when competitors choose to remain on the high street is an example. Alternatively, a firm can undertake the same value chain activities as competitors' but in very different ways. Take for example, Apple's initial iPhone differentiation strategy. Instead of following conventional smartphone differentiation features that revolved around QWERTY keyboards, bands and frequencies, and voice quality, Apple focused on user interface, styling, functionality and branding. Or consider Google's Gmail. The original differentiating factor that contributed to its success in rapidly gaining market share was its offer of 1GB of storage capacity – several hundred times more than incumbents Hotmail and Yahoo! Mail at that time.

²⁴ See <http://www.ppr.com/fr/DataUploadFiles/publications/8463/CP%20La%20Redoute%20211008%20V%20ANG.pdf>, accessed on 31 Aug 2012. Despite the initiative, La Redoute had continued to encounter challenging trading conditions, and earlier this year announced further restructuring. See http://www.catalog-biz.com/articles_details.asp?DocId=3302, accessed on 31 Aug 2012.

²⁵ Porter, M.E. (2001), "Strategy and the Internet", *Harvard Business Review*, 79(2): 63-78.

²⁶ Porter, M.E. (1996), "What is strategy?" *Harvard Business Review*, 74 (6): 61-78.

Radical innovation and first mover advantages

That innovation is an important source of competitive advantage can be traced back to Schumpeter's seminal theory of creative destruction, which holds that radical inventions lead to new technological trajectories, which subsequently form new technological paradigms and new technological regimes. Technological development is viewed as discontinuous change resulting from innovation. Such change, precipitated by radically combining scarce resources to carry out existing activities in new and better ways, or by inventing completely new products and processes, brings about the 'creative destruction' of old practices.²⁷

The central ideas of this paradigm, which emphasises the importance of technology, are just as applicable in today's digital economy as they were in the inter-war economy then, as they imply that novelty and first mover advantages are the key sources of rent creation. Thanks to head-start profits, ie profit accumulation from a novel innovation during lead-time, rents become available to entrepreneurs until the innovations become established practices in economic life, often when catching up or imitation has occurred, at which point the rents diminish as novelty dissipates and knowledge diffuses. Apple's iPod is a current example in the midst of a glut of alternative digital music players (both standalone and as part of smartphones). Research has discovered that, on average, the profit advantage disappears after approximately 10 years for consumer businesses and 12 years for industrial businesses.²⁸

'Schumpeterian rents' effectively stem from risky initiatives, derived from entrepreneurial insights and endeavour, in uncertain and complex environments. Even in the digital economy, entrepreneurs have always sought first mover advantages that can yield competitive advantage by bringing to market radically innovative products and services predicated on disruptive technologies. Some of these products and services have rendered incumbents obsolete, while others have obliterated established markets altogether and created new ones. As mentioned earlier, digital photography has consigned the 35mm film to the annals of history. The digital camera itself is now under increasing threat from smartphones with high-resolution cameras. Skype's VoIP yielded early quality advantage over competing VoIP applications based on the common session initiation protocol, and as a result has lodged itself as the most popular multimedia conferencing application ever since. Apple was the first to introduce a digital music bundle that included both hardware (iPod) and software (iTunes), and remained dominant for a long while despite the entry of imitators to the market. By the same token, BlackBerry, partly to reverse a slide and partly to take on rivals Apple, Samsung-Google and Nokia-Microsoft, is desperate to build a whole new platform for mobile computing based on phones and tablets using its new BlackBerry 10 operating system.

²⁷ Schumpeter, J.A. (1934), *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*, Cambridge, MA: Harvard University Press; Schumpeter, J.A. (1939), *Business Cycles: A Theoretical and Statistical Analysis of the Capitalist Process*, New York, NY: McGraw-Hill; and Schumpeter, J.A. (1942), *Capitalism, Socialism, and Democracy*, New York, NY: Harper.

²⁸ Boulding, W. and Christen, M. (2001), "First-mover disadvantage", *Harvard Business Review*, 79(9): 20-1.

Novelty that comes from radical innovation extends beyond merely products and services. Business model innovation is increasingly acknowledged as a source of competitive advantage in an era where products and services can be easily imitated and their lifecycles are shortening at alarming rates.²⁹ Innovative business models allow firms to create, deliver and capture value in new ways, with or without a pioneering technological innovation. The oft-quoted example of Apple remains a popular case in point. Contrary to popular belief, Apple was not the first to introduce the mp3 player to the world – that accolade belongs to Saehan Information Systems, which introduced the MPMan to the world in 1998. But by taking an excellent albeit nascent technology and wrapping an innovative business model that is the reverse of the razor-and-blade around it, Apple revolutionised portable entertainment, created a new market and saw its market value rise from US\$1 billion in early 2003 to over US\$150 billion four years later.³⁰ Other common examples of pioneering business models in the digital economy include eBay with C2C online auction, Priceline.com with reverse auctions, and Microsoft with the free bundling of web browser Internet Explorer with its Windows operating system. Meanwhile, greater volatility of advertising revenues and the growing popularity of on-demand television fuelled by online technologies have driven broadcasters such as ITV to more vigorously pursue a parallel business model based on content ownership, where popular programme formats can be sold worldwide to generate more stable revenues.

The power of the internet has also enabled the spawning of innovative business models that serve as ‘connectors’ between clients looking for solutions to problems and a network of experts providing the solutions. For example, InnoCentive and AlphaSights offer rapid crowdsourcing solution delivery to firms looking for insights or solutions to certain problems by connecting them with experienced industry practitioners and subject-specific experts on demand across all sectors and geographies. Satalia is a pioneer in the field of dynamic analytics, where it helps firms optimise their algorithms by drawing on its huge network of computing and mathematical sciences experts from universities around the world. If futurists anticipating a new industrial revolution are to be believed, firms may also gain an early foothold in markets through business models that harness the internet and the latest manufacturing technologies to make things, or to enable consumers to ‘make’ things, such as through 3D printing.³¹

²⁹ See for example, Christensen, C.M., Johnson, M.W. and Rigby, D.K. (2002), “Foundation for growth: How to identify and build disruptive new businesses”, *MIT Sloan Management Review*, 43: 22-31; Markides, C. and Charitou, C.D. (2004), “Competing with dual business models: A contingency approach”, *Academy of Management Executive*, 18: 22-36; Morris, M., Schindehutte, M. and Allen, J. (2005), “The entrepreneur’s business model: Toward a unified perspective”, *Journal of Business Research*, 58: 726-35; and Casadesus-Masanell, R. and Ricart, J.E. (2010), “From strategy to business models and to tactics”, *Long Range Planning*, 43: 195-215.

³⁰ Johnson, M.W., Christensen, C.M. and Kagermann, H. (2008), “Reinventing your business model”, *Harvard Business Review*, 86(12): 50-9.

³¹ Anderson, C. (2012), *Makers: The New Industrial Revolution*, London: Random House.

Box 1: Wrapping a clever business model around good technology: Xerox and its copiers

Xerox is an example that shows why superior technology alone may not be enough to help generate competitive advantage. When it invented the Model 914 copier, Xerox was in effect at the forefront of radical innovation by breaking a path in the use of a then state-of-the-art technology. The 914 used the relatively new electrophotography process, a dry process that avoids the use of wet chemicals. But despite what was clearly a superior technology to existing copy methods, Xerox failed to convince the likes of Kodak, GE and IBM to enter into partnership. The cost of the technology was deemed too prohibitive – the machine was about six to seven times more expensive than alternative technologies.

The ingenuity of Xerox was to invent a viable business model capable of creating and delivering value to customers in a profitable way. Xerox decided to go alone in marketing the copier with a business model based on leasing the equipment to customers at a relatively low cost and charging them for copies in excess of 2,000 per month on a per copy fee basis. However, for the business model to be profitable, the number of copies customers made must increase substantially. This very much depended on the capability of the copier, as the average business copier then was capable of producing no more than 20 copies a day. The business model and the technology combined seamlessly, as Xerox's radical innovation lived up to its billing. The capability, quality and convenience of its new machines enabled its corporate customers to make thousands of copies per day, contributing to Xerox's sustained annual growth rate of 41% over a period of 12 years. During its heydays, Xerox was *the* copier of choice.

Source: Adapted from Chesbrough, H. and Rosenbloom, R. (2002), "The role of the business model in capturing value from innovation: Evidence from Xerox Corporation's technology spin-off companies", *Industrial & Corporate Change*, 11(3): 529-55.

However, as cautioned above, superior rents derived from radical innovation lasts for only a finite period; first mover advantages do not always prevail. In certain instances, these can quickly turn into first mover disadvantages as close, or fast, followers prosper.³² Pioneers, or first movers, incur very substantial costs in terms of investments in inventing technologies, establishing distribution systems, learning about new markets and segments, and experimenting with new business models. These costs tend to be lower for followers, provided the imitators are able to learn quickly and undertake their own innovation to improve on the incumbents' technologies, products and services.

Take low cost long haul airlines for example. Although Zoom and Oasis were the pioneers – and both made the most of the digital technologies in marketing available then – both have folded, while AirAsia X, which only came onto the scene in 2009, continues to expand and

³² Teece, D.J. (1982), "Towards an economic theory of the multiproduct firm", *Journal of Economic Behavior and Organization*, 3: 39-63; and Boulding, W. and Christen, M. (2001), *op. cit.*

prosper.³³ Previous examples such as Apple's case in digital music and Microsoft usurping Netscape with its Internet Explorer have shown how fast followers can eventually become market leaders. BlackBerry was once a digital must-have for the busy and highly mobile executive. But the convergence of work and play ushered in by new generations of smartphones, coupled with the firm's slow response in innovating the next generation of BlackBerrys, had left it gasping for breath in a highly competitive market. It was forced to shed almost half of its 20,000-strong workforce, saw its stock price plunge from a lofty high of more than US\$140 to a mere US\$7.25 in the summer of 2012, and suffered the ignominy of IBM sniffing around for its enterprise services division.³⁴

The cost to customers as they switch from the first mover to a challenger is increasingly on a downward trajectory on the web. Owing to the ubiquity and power of search engines at the click of a button, consumers are able to quickly search the market for a cheaper, and perhaps even better, substitute to the iPhone. It is also increasingly arduous for pioneering e-tailers and pure-plays to maintain their dominance when online payment technologies like PayPal enable customers to easily switch without having to re-enter personal information and credit card numbers.

Closely related to the notions of novelty and first mover advantages is the effectiveness of protective intellectual property rights (eg patents, copyrights and trademarks) as complementary assets in the value creation process (see Table 3).³⁵ Despite the government's strengthening of IPR protection, ostensibly to promote firm competitiveness, many new business models in the digital economy have ironically made IP less exclusive by using and making available non-proprietary IP, such as through open sources. While IPR regimes can enable entrepreneurs appropriate value from their innovations, there are also concerns that suboptimal or inappropriate IPR regimes, particularly in the more fluid and less tangible digital economy, may result in a 'tragedy of markets' where every knowledge becomes 'privatised', leading to a knowledge divide that has wider repercussions on society.³⁶

Overzealous protection of IP only threatens to stifle innovation. Should this happen, the IPR system may at best become a drag on firm competitiveness and at worst retard economic growth and progress. Genuine questions persist on whether Samsung really did violate Apple's smartphone patents, and whether consumers and the telecommunications industry will actually be the real losers should Apple's attempt to have eight Samsung devices

³³ Not to be confused with its regionally-focused parent, AirAsia X is the long haul subsidiary of Kuala Lumpur-based AirAsia. It was recently voted the world's best low cost airline for the fourth consecutive year. See http://www.worldairlineawards.com/Awards_2012/lowcost2012.htm, accessed on 4 Sept 2012.

³⁴ "BlackBerry is not in a trough" – RIM CEO Thorsten Heins interview", *The Telegraph*, 2 Aug 2012, available at <http://www.telegraph.co.uk/technology/blackberry/9441949/BlackBerry-is-not-in-a-trough-RIM-CEO-Thorsten-Heins-interview.html>, accessed on 8 Aug 2012; "RIM approached by IBM over sale of corporate BlackBerry software", *The Telegraph*, 10 Aug 2012, available at <http://www.telegraph.co.uk/technology/blackberry/9467260/RIM-approached-by-IBM-over-sale-of-corporate-BlackBerry-software.html>, accessed on 10 Aug 2012.

³⁵ Teece, D.J. (1987), "Profiting from technological innovations: Implications for integration, collaboration, licensing, and public policy", in Teece, D.J. (ed.), *The Competitive Challenge: Strategies for Industrial Innovation and Renewal*, Ballinger: Cambridge, MA: Ballinger.

³⁶ See the arguments set out in the essays in Andersen, B. (ed.) (2006), *Intellectual Property Rights: Innovation, Governance and the Institutional Environment*, Cheltenham: Edward Elgar.

banned in the US be successful. Other cases have similar echoes. For example, the successful prosecution pursued by the lobby group Federation Against Copyright Theft (FACT) against Surfthechannel.com; the OiNK music file-sharing site, which successfully defended itself from prosecution but never reopened; and TVShack.net, whose creator narrowly avoided extradition to the US.

Table 3: Strategic incentives from IPR and non-proprietary IP

Incentives	Business model process
Innovation	Being able to use the best inventions, innovations, creative expressions; innovation methodology for developing better technology or creative expressions; benefiting from user or supplier involvement as a development strategy (eg through learning and feedback); setting common standards/making or using compatible technology or creative expressions.
Building networks, corporate relationships and the community	Increasing ability to enter collaborative agreements (eg joint ventures, strategic alliances); building informal relationships with industry networks; giving something to the community.
Market positioning	Increasing market share (eg building a broader user base or securing market protection); professional recognition or brand recognition; competitive signalling.
Finance	Direct income from market transactions (eg to cover R&D or for profit); increasing ability to raise venture capital; and cost cutting.

The dynamics of information sharing, knowledge exchange and cultural expressions in new spheres such as open source platforms may be curtailed by the current form of IPR legislations, resulting in the retardation of innovation. The growth, widespread use and establishment of alternative IP appropriation models raise the intriguing possibility that innovation and firm competitiveness derived from knowledge creation might successfully be incubated under far more open conditions, including the General Public licence and the Creative Commons licence. While the software sector is familiar with these alternatives, firms in other sectors such as pharmaceuticals, entertainment and publishing are beginning to realise, almost counter-intuitively, that to gain competitiveness in the digital economy they may well have to give their IP away. Formal protection (eg patents and copyrights) is used relatively more by medium-sized and large firms, whereas micro and small firms are relatively more inclined to resort to open source and non-patented IP. In fact, although SMEs benefit from the use of formal IP protection to increase market share, they tend to strongly prefer the open source route when their objectives are linked to innovation.³⁷

There are also arguments that, mainly through head-start rents and lock-in effects to technological trajectories, value appropriation and competitive advantage can be realised even without IP protection and innovation spawned without the protective assurances of

³⁷ Andersen, B. and Rossi, F. (2011), "Chapter 5: The United Kingdom: Intellectual asset management strategies for diverse innovations", in OECD, *Intellectual Assets and Innovation: The SME Dimension*, Paris: The Organisation for Economic Co-operation and Development.

patents.³⁸ Losing the ‘look and feel’ lawsuit against Microsoft in the mid-1990s did not stop Apple from innovating and eventually becoming the most valuable firm of all time. IPR flexibility is key to generating competitive advantage from radical innovation. Evidence suggests that higher performing firms actually use a wider variety of IP protection than conventional wisdom suggests.³⁹

While many of these issues fall squarely within the domain of policy-makers, the implications of an IPR regime that befits the digital age and that holistically considers the interests of various stakeholders in relation to enforcement, rights, cyber security and data protection are profound and wide ranging for firms. From the perspective of enabling a wider array of firms to have a decent shot at building competitive advantage, there might be a strong case for a flexible, or ‘neutral’, IPR regime, particularly in sectors with the greatest and most direct participation in the digital economy.

Intangible resources and competencies

While the Porterian school places primacy on external industry structures and markets as the locus of competitive advantage, an equally important paradigm – the resource-based view – looks inward towards the internal resources of the firm. This view holds that specialised competencies and capabilities that may lead to value creation, and by extension competitive advantage, are underpinned by the deployment of valuable resources that are rare, inimitable and non-substitutable.⁴⁰ These resource bundles and capabilities are assumed to be heterogeneous across firms, and therefore firms vary in their ability to create value with specific resources.⁴¹ This, with echoes of Ricardian comparative advantage, allows for asymmetric firms to coexist until some fundamental or Schumpeterian shock occurs.

In other words, that which determines whether a firm triumphs in competition and enjoys superior returns lies in its idiosyncratic and difficult-to-imitate resources. Firm performance is therefore not just a function of the opportunities and structures it confronts; it also depends on what resources the firm can muster. Rents are derived not merely from clever strategic positioning, but by configuring scarce firm-specific resources in a way that competitors find hard to copy. Firm-specific resources are many and varied, but such intangible resources as strong intellectual capital, a dominant brand, institutionalised competencies and

³⁸ See Andersen, B. (2003), “The rationales for intellectual property rights in the electronic age”, in Jones, D. (ed.), *The New Economy Handbook*, San Diego, CA: Elsevier Academic Press; Mansfield, E. (1986), “Patents and innovation: An empirical study”, *Management Science*, 32: 173-81; and Cohen, W., Nelson, R. and Walsh, J. (2000), “Protecting their intellectual assets: Appropriability conditions and why U.S. manufacturing firms patent (or not)”, NBER Working Paper No.w7552.

³⁹ Andersen, B. and Rossi, F. (2011), *op. cit.*

⁴⁰ Penrose, E.T. (1959), *The Theory of Growth of the Firm*, London: Basil Blackwell; Wernerfelt, B. (1984), “A resource-based view of the firm”, *Strategic Management Journal*, 5(2): 171-80; Barney, J.B. (1991), “Firm resources and sustained competitive advantage”, *Journal of Management*, 17: 99-120; and Peteraf, M.A. (1993), “The cornerstones of competitive advantage: A resource-based view”, *Strategic Management Journal*, 14(3): 179-91.

⁴¹ Conner, K.R. (1991), “A historical comparison of resource-based theory and five schools of thought within industrial organization economics: Do we have a new theory of the firm?” *Journal of Management*, 17: 121-54; Lippman, S.A. and Rumelt, R.P. (2003), “A bargaining perspective on resource advantage”, *Strategic Management Journal*, 24: 1069-86.

organisational culture are particularly crucial for firms in the digital economy. Superior returns flow from a combination of lower costs, innovative and attractive products or services, higher quality, and insights that allow the firm to better meet customer needs.

Intellectual capital, for example, is central to the firm's ability to learn and apply knowledge for profitable returns.⁴² Knowledge workers have long been acknowledged as central to the competitiveness of firms whose main activities are knowledge intensive. A single knowledge worker contributes three times more to the firm's profit than other workers.⁴³ In the early 1990s, about half of the value added at Siemens came from knowledge-intensive products and services, while in 2002 this had increased to between 60% and 80%, and was still growing.⁴⁴ A firm's carefully cultivated and nurtured brands create trust and brand equity, both of which are critical for driving sales and building firm competitiveness.⁴⁵ Interestingly, seven of the top ten brands in the world (IBM, Microsoft, Google, GE, Intel, Apple and HP), and four of the five biggest risers (Apple, Amazon, Google and Samsung), all come from the technology sector.⁴⁶ Institutionalised competencies such as organisation-wide capabilities to apply advanced analytics as the norm for decision-making is another key driver of firm competitiveness.⁴⁷ A firm's unique, strategically appropriate and strong but adaptive culture can also be a source of effectiveness and competitive advantage.⁴⁸

A key challenge in the digital age even for firms that are well endowed with critical resources is the preservation and sustainability of competencies and capabilities. As information-based resources and capabilities (eg knowledge workers, tacit knowledge) have higher mobility than the capabilities tied up in physical resources, the likelihood of value migration may increase while the sustainability of newly created value may decrease. To attenuate this, firms consider the transformation of tacit knowledge to codified information to be critical to performance.⁴⁹ In most cases, firms can also count on institutionalised competencies and capabilities tied in collective routines and practices within the firm. These are in principle less mobile and should reside within the firm, forming part of the firm's valuable and unique resources. But the digital economy has also enabled the increasing use of software packages to 'design' business practices and model organisational routines, thus causing

⁴² Prahalad, C.K. and Hamel, G. (1990), "The core competence of the corporation", *Harvard Business Review*, 68(3): 79-87; Nonaka, I. (1994), "A dynamic theory of organizational knowledge creation", *Organization Science*, 5(1): 14-37.

⁴³ Guthridge, M., Komm, A.B. and Lawson, E. (2008), "Making talent a strategic priority", *McKinsey Quarterly*, Jan: 49-59.

⁴⁴ Davenport, T.H. and Probst, G.J.B. (2002), "Siemens' knowledge journey", in Davenport, T.H. and Probst, G.J.B. (eds.), *Knowledge Management Case Book: Siemens Best Practices*, 2nd ed., Erlangen: Publicis.

⁴⁵ Doney, P.M. and Cannon, J.P. (1997), "An examination of the nature of trust in buyer-seller relationships", *Journal of Marketing*, 61(2): 35-51; Aaker, D.A. (1991), *Managing Brand Equity*, San Francisco, CA: Free Press.

⁴⁶ Interbrand (2011), *Best Global Brands 2011*, London: Interbrand.

⁴⁷ See Wong, D. (2012), *op. cit.*

⁴⁸ Barney, J.B. (1986), "Organizational culture: Can it be a source of sustained competitive advantage?" *Academy of Management Review*, 11: 656-65; Kotter, J.P. and Heskett, J.L. (1992), *Corporate Culture and Performance*, New York, NY: Free Press; Denison, D.R. and Mishra, A.K. (1995), "Toward a theory of organizational culture and Effectiveness", *Organization Science*, 6(2): 204-23; Saffold, G.S. (1998), "Culture traits, strength, and organizational performance: Moving beyond strong culture", *Academy of Management Review*, 13: 546-58; Ogbonna, E. and Harris, L. (2000), "Leadership style, organizational culture and performance: Empirical evidence from UK companies", *International Journal of Human Resources Management*, 11(4): 766-88.

⁴⁹ Cohendet, P. and Steinmueller, W.E. (2000), "The codification of knowledge: A conceptual and empirical exploration", *Industrial and Corporate Change*, 9(2): 195-209.

these 'designed' competencies and practices to lose their uniqueness.⁵⁰ By using the same software and inputting more or less the same parameters and variables, competitors can adopt very similar practices. In other words, software-based routines have greater mobility despite, ironically, being a form of codified knowledge.

The digital economy also creates a paradox of resource ownership. While the ownership of resources has been a key tenet of the resource-based view of the firm, the notion that resources and capabilities necessarily reside exclusively within the boundaries of the firm is increasingly challenged. Digital technologies have enabled alternatives to ownership or control of resources and capabilities, as data, information, technological know-how and learning processes are increasingly being shared among firms through either proprietary or open networks. Pharmaceutical giants including the likes of GlaxoSmithKline, Pfizer, AstraZeneca and Novartis have formed a coalition in the US to share data on thousands of Alzheimer's and Parkinson's patients in the quest to find innovative treatments of neurodegenerative diseases.⁵¹

For firms wishing to innovate more quickly to build or sustain competitive advantage, it is fast becoming an imperative to harness the power of digital technologies to look beyond organisational boundaries for insights and knowledge, and to explore opportunities for co-creation and co-learning with other firms. The Ford Motor Company, PepsiCo and Southwest Airlines are among organisations that analyse postings about them on Facebook and Twitter to gauge the immediate impact of their marketing campaigns and to feel the changing pulse of consumer sentiments about their brands.⁵² Amazon simply asks customers regarding choices of service features or a more efficient check-out process, with answers capable of being obtained in real-time.⁵³ Open source techniques and crowdsourcing have spawned innovative products and services such as OpenOffice, the Oxford English Dictionary and Wikipedia. Facebook made full use of its community for product development by recruiting some 300,000 users to translate its site into 70 languages. Remarkably, it took just a day to translate the site into French.

Although it may represent an even greater challenge to resource preservation, open innovation by means of accessing resources through partnerships and resource-sharing alliances appears to be the way forward for growth and competitiveness in an increasingly open and networked digital economy. Tapping into intangible resources and competencies in the digital economy is likely to be more about sharing rather than owning.

⁵⁰ Porter, M.E. (2001), *op. cit.*

⁵¹ See Romero, K., De Mars, M., Frank, D., Anthony, M., Neville, J., Kirby, L., Smith, K. and Woosley, R.L. (2009), "The Coalition Against Major Diseases: Developing tools for an integrated drug development process for Alzheimer's and Parkinson's diseases", *Clinical Pharmacology and Therapeutics*, 86(4): 365-7; and Critical Path Institute website, available at <http://www.c-path.org/camd.cfm>, accessed on 17 Jul 2012.

⁵² Bughin, J., Chui, M. and Manyika, J. (2010), "Clouds, big data, and smart assets: Ten tech-enabled business trends to watch", *McKinsey Quarterly*, Aug.

⁵³ Brynjolfsson, E. (2011), "ICT, innovation and the e-economy", EIB Papers 8/2011, European Investment Bank, Economics Department.

Organisational ambidexterity

While firm-specific resources may be an important source of competitive advantage, they may not be enough to sustain or increase a firm's competitive position, particularly in a dynamic, rapidly evolving digital economy. Many firms have accumulated large stocks of valuable resources and core capabilities but still lost their competitive advantage. Despite being the dominant player in the photographic film market and having invented the digital camera, Kodak filed for US Chapter 11 bankruptcy protection. Nokia had for many years been the market leader in mobile phones but lost significant market share in recent years to more dynamic and faster-innovating rivals like Samsung and Apple. Despite being the market leader in mainframes, IBM's fortunes took a plunge in the late 1980s, and in 1991 its market value slumped to the lowest point since 1983.

Recent thinking has built on but transcended the resource-based view to emphasise the importance of dynamic capabilities. Dynamic capabilities are organisational and strategic routines, or practices, by which firms achieve new resource configurations as markets and the environment change.⁵⁴ In this context, 'dynamic' refers to the capacity to reconsider and re-evaluate competencies (eg certain innovative responses are required in the face of rapid technological change or when new opportunities and threats arise), while 'capabilities' refers to the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organisational skills, resources and functional competencies to match the requirements of a changing environment.⁵⁵ Examples include the practice of exploration and exploitation in innovation,⁵⁶ and sensing and seizing opportunities and threats that lead to change.⁵⁷

While dynamic capabilities provide the basis on which a firm's competitiveness can be analysed, the real source of competitive advantage lies in the degree to which a firm is ambidextrous in responding to change and challenges by capitalising on its dynamic capabilities.⁵⁸ In simple terms, if dynamic capabilities are viewed as a form of resource, organisational ambidexterity is the ability to make good use of that resource. Winners are ambidextrous firms that are able to strategically deploy their dynamic capabilities, ie those that can respond quickly and flexibly to changing conditions, and effectively coordinate and redeploy internal and external competencies in ways that are valuable to the customer but difficult for competitors to imitate, or imitate quickly enough. They are those that are

⁵⁴ Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, 18(7): 509-33; Teece, D.J. and Pisano, G. (1994), "The dynamic capabilities of firms: An introduction", *Industrial and Corporate Change*, 3(3): 537-56; Teece, D.J., Katkalo, V.S. and Pitelis, C.N. (2010), "Introduction: On the nature and scope of dynamic capabilities", *Industrial & Corporate Change*, 19(4): 1175-86.

⁵⁵ Dynamic capabilities are rooted in value-creating organisational processes including product development, strategic decision-making, alliance formation, knowledge creation and capabilities transfer. See Eisenhardt, K. and Martin, J. (2000), "Dynamic capabilities: What are they?" *Strategic Management Journal*, 21: 1105-21.

⁵⁶ March, J.G. (1991), "Exploration and exploitation in organizational learning," *Organization Science*, 2(1): 71-87.

⁵⁷ Harreld, J.B., O'Reilly, C.A. and Tushman, M.L. (2007), "Dynamic capabilities at IBM: Driving strategy into action", *California Management Review*, 49(4): 21-43.

⁵⁸ O'Reilly, C.A. and Tushman, M.L. (2008), "Ambidexterity as a dynamic capability: Resolving the innovator's dilemma," *Research in Organizational Behavior*, 28(1): 185-206. It has also been argued that long-term competitive advantage in dynamic markets lies in resource configurations, not dynamic capabilities. See Eisenhardt, K. and Martin, J. (2000), *op. cit.*

ambidextrous enough to undertake both exploration and exploitation activities as part of their innovation process, or whose senior management are ambidextrous enough to combine strategic insights with strategic execution. In many ways, these can also be described as the ability to manage strategic paradoxes simultaneously.⁵⁹

Organisational ambidexterity has become even more crucial for innovation and firm competitiveness in the digital economy, primarily because the dynamism of the digital age requires an equally dynamic response from firms. To win the competitive battles in fast changing high technology industries such as telecommunications, semiconductors, computing, software and information services, it is necessary to understand that gaining competitive advantage goes beyond merely accumulating largely static, albeit superior, resources. Ambidextrous firms are able to innovate their business models to take advantage of technological innovations and market opportunities. Despite being among the pioneers of digital photography and the personal computer respectively, Kodak and Xerox were too fixated with their core products, lacked flexibility to harness the potential of new technologies, and could not figure out how to integrate these new technologies into their overall business models. In the case of the latter, some of its technologies, including those that went on to spawn the Ethernet and LAN elsewhere, were 'orphaned' because Xerox did not know what to do with them.⁶⁰

Organisational ambidexterity predicated on dynamic capabilities has been credited as the source of IBM's resurgence, as it enabled the once great mainframe giant to successfully reinvent its business model to focus on software and services. Along the way, the firm has also been able to leverage its intellectual capital in these areas into businesses as diverse as life sciences, automotive and banking. By moving away from the conventional silos of hardware, software and services to an integrated structure geared towards providing solutions for customer needs, IBM placed strategic primacy on ambidextrous practices such as sensing-seizing opportunities and exploring-exploiting new knowledge. Its Emerging Business Opportunities process, for example, was designed to address emerging growth opportunities that may not fit well within existing businesses where most resources were concentrated.⁶¹

Given that certain dynamic capabilities – bearing in mind these are essentially high level routines, or practices – may be particularly useful for a particular industry, or a predominant type of economy, what is important is the ambidexterity that allows the firm to renew its

⁵⁹ Smith, W.K., Binns, A. and Tushman, M.L. (2010), "Complex business models: Managing strategic paradox simultaneously", *Long Range Planning*, 43: 448-61; Hampden-Turner, C.M. (1990), *Charting the Corporate Mind: From Dilemma to Strategy*, Oxford: Basil Blackwell.

⁶⁰ For Kodak, see Lucas, H.C. and Goh, J.M. (2009), "Disruptive technology: How Kodak missed the digital photography revolution", *Journal of Strategic Information Systems*, 18(1): 46-55; Pohle, G. and Chapman, M. (2006), "IBM's global CEO report 2006: Business model innovation matters", *Strategy & Leadership*, 34(5): 34-40. For Xerox, see Chesbrough, H. and Rosenbloom, R. (2002), "The role of the business model in capturing value from innovation: Evidence from Xerox Corporation's technology spin-off companies", *Industrial & Corporate Change*, 11(3): 529-55.

⁶¹ O'Reilly, C.A., Harreld, J.B. and Tushman, M.L. (2009), "Organizational ambidexterity: IBM and emerging business opportunities", *California Management Review*, 51(4): 75-99; Harreld, J.B., O'Reilly, C.A. and Tushman, M.L. (2007), *op. cit.*

capabilities to remain dynamic when it makes the leap into another industry or type of economy. Prior to the Nokia that we know today, the firm's original focus was on paper, rubber and cable industries, and later consumer electronics. Notwithstanding several hiccups and setbacks along the way, Nokia successfully mastered the capabilities that transformed the firm from a slow-moving conglomerate to a strategically agile and focused telecommunications market leader by the mid-1990s.⁶² But as the digital age kicked on, Nokia had been slow to readjust in order to grab a foothold in the then emerging smartphone market, where it is now trailing both Samsung and Apple. Its share of the overall mobile phone market slid last year from a third to about 29%, while its stock price recently hit a 16-year low.⁶³

There are firms, though, that have fallen into the subtle pit of false ambidexterity and dynamism in the digital economy. While being flexible enough to incubate innovative business models parallel to the firm's main business might work for some firms under certain circumstances and conditions, others have found firm separation to be counterproductive to competitive advantage. For example, instead of reaping the benefits of being dynamic, firms that create a separate online entity instead of integrating its online operations into the overall business model might fail to capitalise on its traditional assets. In setting up a separate online business, America's largest book retailer Barnes and Noble had inadvertently prevented the online business from capitalising on the strengths of its network of physical stores.⁶⁴

Network effects and externalities

Network effects drive competitive advantage in two ways: network externalities and inter-firm networks. The digital economy, not least through the internet, offers immense opportunities for firms to create networks among consumers and reap the benefits of network externalities tied to the firm's products or services. The basic idea of network externalities is that the value of a product increases as the number of users grows.⁶⁵ If there is only a single person in the world who has access to the internet, the internet will not be of much value – there is simply no one to whom the lone user can send an email, and only he will be able to develop websites that he alone will then browse. But as more people have access to the internet, the expanding network of users causes the internet to become more valuable.

One of the keys to competitive advantage associated with network externalities is the

⁶² Kosonen, M. and Doz, Y. (2008), "The dynamics of strategic agility: Nokia's rollercoaster experience", *California Management Review*, 50(3): 95-118; Aspara, J., Lamberg, J.-A., Laukia, A. and Tikkanen, H. (2011), "Strategic management of business model transformation: Lessons from Nokia", *Management Decision*, 49(4): 622-47.

⁶³ "Nokia profit declines as market share falls", *The Telegraph*, 21 Apr 2011, available at <http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/telecoms/8466235/Nokia-profit-declines-as-market-share-falls.html>, accessed on 6 Sept 2012; "Nokia shares hit 16-year low", *FT.com*, 9 Jul 2012, available at <http://www.ft.com/cms/s/0/c4775ee8-c9e3-11e1-844e-00144feabdc0.html#axzz25gvH9GEH>, accessed on 6 Sept 2012.

⁶⁴ Porter, M.E. (2001), *op. cit.*

⁶⁵ Economides, N. (1996), "The economics of networks", *International Journal of Industrial Organization*, 14(2): 673-99; Farrell, J. and Saloner, G. (1985), "Standardization, compatibility, and innovation", *RAND Journal of Economics*, 16(1): 70-83; Katz, M. and Shapiro, C. (1985), "Network externalities, competition and compatibility", *American Economic Review*, 75(3): 424-40.

familiar economics concept of scale. Creating the first edition of a brand new software, or the first design of a new semiconductor chip, is undoubtedly costly, but running off further copies costs almost next to nothing. However, running off further copies will only be possible if there is sufficient demand, which network externalities can help create. In certain cases, thanks to externalities, firms can generate handsome returns not only on volume but also on price – an effect that is seemingly counter-intuitive, as prices tend to fall over time as product adoption widens. Research into spreadsheet products, for example, has shown that network externalities, as measured by the size of a product's installed base, significantly increase the retail price of the product – a 1% increase in a product's installed base leads to a 0.75% increase in its price.⁶⁶

Because of the highly networked nature of the digital economy, firms in many sectors can build or enhance competitive advantage if their products or services are able to amass users on a large scale.⁶⁷ Popular social networking sites such as Facebook, Twitter and LinkedIn rely on the sheer scale of their networks to enhance their value. MySpace was once the most popular social networking site in the world, surpassing even Google in June 2006 as the most visited site in the US.⁶⁸ But ever since it was overtaken by Facebook in April 2008 in terms of unique visitors worldwide, MySpace's fortunes, as well as its user base, have steadily declined. At the time of writing, it is ranked 182nd in the world by total web traffic, whereas Facebook, whose network has steadily grown, is ranked 2nd.⁶⁹ Leveraging on its bulging network of users, Facebook opened its platform for free to developers in 2007. In just three months third-party applications on its platform had reached 3,000, and a few months later were responsible for more than a third of Facebook traffic.⁷⁰ MySpace, meanwhile, has been forced to undergo a dramatic redesign as it seeks to regain the massive popularity it enjoyed almost a decade ago. Mobile communication firms likewise benefit from network externalities, which arguably incentivised the Orange-T-Mobile merger in the UK to form EE.

Network externalities as a source of competitive advantage is closely linked to an effect called 'path dependence'.⁷¹ If a product, for whatever reason, including pure chance, obtains enough users early on, there is a strong possibility that the product may be favoured over an alternative of higher innate quality just because it has built up an established user base. It is

⁶⁶ Brynjolfsson, E. and Kemerer, C.F. (1996), "Network externalities in microcomputer software: An econometric analysis of the spreadsheet market", *Management Science*, 42(12): 1627-47.

⁶⁷ With scale being the main requirement, the concept of network externalities, though wrapped in modern parlance, is in effect not dissimilar to what Harvey Leibenstein called the 'bandwagon effect' in 1950, ie the extent to which the demand for a commodity is increased due to the fact that others are also consuming the same commodity. Consumers purchase a commodity in order to get into 'the swim of things', or to conform with the people they wish to be associated with, or to be seen as fashionable or stylish. See Leibenstein, H. (1950), "Bandwagon, snob, and veblen effects in the theory of consumers' demand", *The Quarterly Journal of Economics*, 64(2): 183-207.

⁶⁸ "MySpace, America's number one", *Mashable.com*, 11 Jul 2006, available at <http://mashable.com/2006/07/11/myspace-americas-number-one>, accessed on 7 Sept 2012.

⁶⁹ For MySpace, see <http://www.alex.com/siteinfo/myspace.com>, and for Facebook, see <http://www.alex.com/siteinfo/facebook.com>, both accessed on 7 Sept 2012.

⁷⁰ Piskorski, M.J., Eisenmann, T.R., Chen, D. and Feinstein, B. (2008), "Facebook", Harvard Business School Case 9-808-128, Boston, MA: Harvard Business School Publishing.

⁷¹ Liebowitz, S.J. and Margolis, S.E. (1995), "Path dependence, lock-in and history", *Journal of Law, Economics and Organization*, 11(1): 205-26; Arthur, W.B. (1990), "Positive feedbacks in the economy", *Scientific American*, 262(2): 92-9.

as though the market has made a long-term, quasi-irreversible commitment to the product, to the exclusion of other competing products. Economic rents in this sense is very much Schumpeterian, as the firm whose product has lodged itself in the favoured trajectory is well positioned to reap first mover advantages – until, of course, another radical innovation disrupts the equilibrium.

A classic example is the videotape format war in the 1980s between JVC's VHS and Sony's Betamax. Although Betamax could boast of superior technology, VHS initially gained a majority of users thanks in large part to JVC's strategy of dominating the rental market, a route that Sony somehow decided not to go down.⁷² Path dependence also explains why QWERTY prevailed over Dvorak as the standard for typewriters and later keyboards,⁷³ and is now widely used in smartphones. Microsoft's Windows operating system and Office software are other clear examples. No matter how attractive the alternatives are, including free open source operating system Linux and productivity suites OpenOffice and Google Docs, Windows and Office remain dominant as a result of a deeply entrenched path chartered by a huge network of users built up early on. Firms learn very quickly that whoever gets biggest the fastest will probably end up dominating the market.

Path dependence and externalities are also closely associated with network lock-in effects.⁷⁴ Where path dependencies and network externalities have been established, consumers often find themselves locked in to the product or service, or a technological infrastructure or network, which makes it even more difficult for competitors to gain significant foothold in the affected markets. The Microsoft example above is a case in point. Having been locked in to Windows, PC users are more likely to purchase Windows-compatible software, a market where Microsoft makes much of its money. Users are also effectively locked in to future upgrades of the operating system itself. Similarly, software-hardware lock-in effectively underscores Apple's reverse of the razor-and-blade business model for its iPod and iTunes.⁷⁵ A lesser known example is Virata, which, in the era of dial-up access and before the DSL semiconductor market became commoditised, likewise monetised its business model through what it then called the 'coupling' of hardware (semiconductors) and software (integrated software on silicon).⁷⁶

Lock-in is about establishing critical mass of users of dominant design standards, learning effects, technological webs, and physical and technological infrastructures.⁷⁷ Mindful of path dependency and network externalities, and having learned the lessons of its Betamax defeat to VHS, Sony was determined to ensure its Blu-ray technology won the high-definition DVD standard war against Toshiba's HD-DVD. In a case of being once-bitten-twice-shy, Sony's

⁷² Cusumano, M.A., Mylonadis, Y. and Rosenbloom, R.S. (1992), "Strategic maneuvering and mass-market dynamics: The triumph of VHS over Beta", *Business History Review*, 66(1): 51-94.

⁷³ David, P.A. (1985), "Clio and the economics of QWERTY", *American Economic Review*, 75(2): 332-7.

⁷⁴ See Amit, R. and Zott, C. (2001), *op. cit.*

⁷⁵ Johnson, M.W., Christensen, C.M. and Kagermann, H. (2008), *op. cit.*

⁷⁶ Information adapted from the author's interview with former Virata CEO Charles Cotton.

⁷⁷ Arthur, W.B. (1988), "Competing technologies", in Dosi, G., Freeman, C., Nelson, R., Silverberg, G. and Soete, L. (eds.), *Technical Change and Economic Theory*, London: Pinter; Arthur, W.B. (2009), *The Nature of Technology: What It Is and How It Evolves*, New York, NY: Free Press.

games console PlayStation 3, which was bundled with Blu-ray discs, was deliberately sold at an estimated loss of more than US\$200 per unit, resulting in losses estimated at about US\$3 billion⁷⁸ – all this to create a lock-in effect between hardware and software and to build a critical mass among buyers in reverse fashion to its Betamax's predicament.

For firms seeking competitive advantage this way, the *raison d'être* for lock-in via network externalities and path dependency is to motivate customers to engage in repeat purchase, to trade-up, or to purchase complementary products and services. In this context, it is about building increasing returns to adoption when customers interact with the products or services. Lock-in is essentially manifested by creating high switching costs. Few would be motivated to switch to Google+ or Bebo if the majority of people in their social network remain with Facebook. Likewise, many traditional PC users are quite reluctant to switch to Apple's Mac, as it will incur the inconvenience of spending time to familiarise with a new system in addition to the costs in purchasing Mac-compatible software.⁷⁹ Because of the attractiveness of its Clubcard points and rewards, shoppers at Tesco might be reluctant to shop elsewhere, unless necessary and more convenient.

The stakes for firms engaged in the lock-in game through network effects can be very high. Getting it right by successfully establishing an early dominant position in the market, and strategically manoeuvring to sustain this position, can result in a winner-takes-all situation. Some firms, such as Sony with its Blu-ray and PlayStation 3, have gone to great lengths, including being loss leaders, just to attain such position. Getting it wrong, firms may see their competitiveness ebb away once users desert their networks in droves to join newly established ones, as MySpace and Yahoo! discovered vis-à-vis Facebook and Google respectively. It is clear that such effects have been a significant motivation for technology firms' aggressive acquisition of businesses that may form part of their ecosystems. From its purchase of YouTube in the past to the more recent acquisitions of Motorola Mobility and Nik Software, the developer of smartphone photo editing app Snapseed, Google clearly understood the potentially lucrative returns from network effects. Microsoft, in the meantime, is playing catch-up with Apple's iOS and Google's Android in the mobile apps market. Despite now offering more than 100,000 apps on the Windows 8 mobile platform, Microsoft still has its work cut out as its rivals enjoy head-start dominance with significantly larger app stores. This network effect can perhaps partly explain why consumers have thus far been reluctant to defect in droves to Nokia's Lumia phones.

Network externalities may also create complementarities that enhance value to customers, and thereby help drive firm competitiveness. Complementarities exist when the bundling of

⁷⁸ "Betamax memories erased as Blu-ray triumphs", *FT.com*, 19 Feb 2008, available at <http://www.ft.com/cms/s/0/11a94e68-df26-11dc-91d4-0000779fd2ac.html#axzz25gvH9GEH>, accessed on 6 Sept 2012; "How the Blu-ray war was won – Sony outspent, outsold Toshiba", *The Times Online*, 21 Feb 2008, available at http://business.timesonline.co.uk/tol/business/industry_sectors/media/article3405959.ece, accessed on 6 Sept 2012.

⁷⁹ Learning as a switching cost is described in, for example, Smith, M.D., Bailey, J. and Brynjolfsson, E. (1999), "Understanding digital markets: Review and assessment", in Brynjolfsson, E. and Kahin, B. (eds.), *Understanding the Digital Economy*, Cambridge, MA: MIT Press. In e-business, familiarity with the interface design of a website may inhibit customers from switching to other sites where their learning would have to begin again.

products or services provides more value than each product or service does on its own.⁸⁰ Complementarities do not necessarily exist from just the bundling of a firm's own products. Competitors' products may also be complementary if customers value the firm's product more when they have access to competitors' products, rather than when they have only the firm's product.⁸¹ The internet has made offering complementary products and services much easier. These may take the form of vertical complementarities such as after sales services that can range from customer forum and online support to downloadable upgrades and extended warranties, or horizontal complementarities such as retail sites for one-stop shopping where a customer buying a camera may also purchase memory cards, tripods and specialist image editing software. Among the key value drivers for customers are convenience, reduced search costs and improved decision-making, whereas for firms complementarities may lead to increased efficiency, enhanced brand image and customer repeat purchase.

Complementary products and services may not be directly related to the core transactions. Google, for example, features targeted advertising of a wide range of products and services based on intelligent content recognition while someone uses Gmail. It is also increasingly common for firms to offer both vertically- and horizontally-complementary products and services. Travel sites such as Expedia and TravelSupermarket.com, in addition to flights, hotels, car hire and conventional after sales services, offer a range of complementary services, often in conjunction with partners, such as travel insurance, visa requirement checking, currency converter, weather forecast, airport parking, transfers and travel advice. Tesco sells not only groceries and non-food items with some after sales service, but also insurance, banking products, utilities, mobile phone packages and broadband.

Network effects also manifest in inter-firm networks, which can be conceived of as stable inter-organisational ties, or bonds (formal or informal), that are strategically important to member firms.⁸² These may traditionally take the form of joint ventures and long-term buyer-supplier partnerships,⁸³ but also in recent times have included co-creation of outcomes based on open innovation platforms and business models. The famed Japanese *keiretsu* and Tesco's network of non-grocery suppliers (eg insurance, utilities as described above) are examples of the former. The Coalition Against Major Diseases, which involves a number of pharmaceutical giants in the US, is an example of the latter,⁸⁴ as is Procter & Gamble, which through its Connect and Develop programme licenses or acquires products from other firms and markets them under P&G brands.⁸⁵ Given that dynamic ecosystems made up of many firms and institutions are the basis on which open innovation flourishes, these complex inter-firm networks are increasingly becoming an important source of innovation that leads to

⁸⁰ Teece, D.J. (2000), "Strategies for managing knowledge assets: The role of firm structure and industrial context", *Long Range Planning*, 33: 35-54; Katz, M. and Shapiro, C. (1985), *op. cit.*

⁸¹ Brandenburger, A.M. and Nalebuff, B.J. (1996), *Co-opetition*, New York, NY: Doubleday.

⁸² Dyer, J. and Singh H. (1998), "The relational view: Cooperative strategy and sources of interorganizational competitive advantage", *Academy of Management Review*, 23(4): 660-79.

⁸³ Gulati, R., Nohria, N. and Zaheer, A. (2000), "Strategic networks", *Strategic Management Journal*, 21(3): 203-15.

⁸⁴ See Romero, K., De Mars, M., Frank, D., Anthony, M., Neville, J., Kirby, L., Smith, K. and Woosley, R.L. (2009), *op. cit.*; Critical Path Institute website, available at <http://www.c-path.org/camd.cfm>, accessed on 17 Jul 2012.

⁸⁵ Chesbrough, H.W. (2007), "Why companies should have open business models", *MIT Sloan Management Review*, 48(2): 22-8.

competitive advantage. They can also ensure the firm's survival, at least in the short-term, when things go badly wrong, as in Samsung's case. Although Apple was awarded US\$1 billion in damages in its courtroom battle with Samsung over patents,⁸⁶ it is unlikely to attempt to wipe Samsung off the market as both firms' fortunes are somewhat more closely intertwined than that which meets the eye – Samsung is also Apple's supplier for many of its chips.

Inter-firm networks can also be a source of competitive advantage to firms mainly due to the advantages specific networks can offer. These may include access to information and markets, control over pricing, and coordination of offerings. Qantas's new alliance with Emirates, which goes much deeper than conventional code-sharing partnerships, is explicitly about reaping these benefits.⁸⁷ Firms, particularly those in technology, can also benefit by making use of its networks to allow itself to focus on core activities and adopt licensing-based business models. Qualcomm was a manufacturer of its own mobile phones and base stations before deciding to focus on making chips and license out its technologies.⁸⁸ Networks also offer the potential to share knowledge and facilitate learning,⁸⁹ to share risks and achieve economies of scale and scope,⁹⁰ and to shorten time-to-market through improved coordination between firms.⁹¹ Firms can also benefit from transaction efficiencies by optimally structuring networked production and distribution systems, not unlike Amazon, whose value chain activities including sales, warehousing, inventory, ordering and delivery are all seamlessly inter-connected.

Nokia's partnership with Microsoft has been strategically crafted to create synergies between mobile communications and computing, and to help the firms wrestle back their competitive advantage, in the case of the former, from Apple and Samsung, and the latter, from Google. The tie-up gives the Finnish mobile communications giant access to Windows Phone ahead of other manufacturers, while at the same time benefiting from Microsoft's significant marketing budget for the operating system. It also allows Microsoft to gain a foothold in the mobile market dominated by Google's Android and Apple's iOS, and access to the mapping technology that Nokia developed.

⁸⁶ "Jury awards \$1bn patent victory to Apple", *FT.com*, 25 Aug 2012, available at <http://www.ft.com/cms/s/0/3472fa2c-ee3d-11e1-a9d7-00144feab49a.html#axzz26uFozfef>, accessed on 27 Aug 2012.

⁸⁷ "Qantas agrees alliance with Emirates", *FT.com*, 6 Sept 2012, available at <http://www.ft.com/cms/s/0/7ba99556-f7c3-11e1-ba54-00144feabdc0.html#axzz2641s5Sb3>, accessed on 7 Sept 2012.

⁸⁸ Chesbrough, H.W. (2007), *op. cit.*

⁸⁹ Anand, B.N. and Khanna, T. (2000), "Do firms learn to create value? The case of alliances", *Strategic Management Journal*, 21(3): 295-315.

⁹⁰ Katz, M. and Shapiro, C. (1985), *op. cit.*; Shapiro, C. and Varian, H.R. (1999), *Information Rules: A Strategic Guide to the Network Economy*, Boston, MA: Harvard Business School Press.

⁹¹ Kogut, B. (2000), "The network as knowledge: Generative rules and the emergence of structure", *Strategic Management Journal*, 21(3): 405-25.

Transaction cost efficiency

Digital technologies have undoubtedly enabled higher volumes of transactions to be conducted more efficiently. Transaction efficiency is an important source of competitive advantage, as it reduces costs for both firms and customers and allows for the extraction of more value from transactions. Transactions may include the costs associated with planning, adapting, executing and monitoring task completion.⁹² Firms economise on transaction costs mainly by strategically choosing the most efficient form of governance,⁹³ that is by deciding when to internalise operations, or produce internally, and when to outsource operations. Since the mid-1990s outsourcing, which in some cases also resulted in offshoring, non-core operations has become a growing trend, ostensibly to enable firms to focus on core competencies.

In the digital economy, though, the scope of transaction cost efficiency has transcended merely deciding on governance forms to include many aspects of operations that some firms choose to internalise. The internet has enabled greater efficiencies and cost savings⁹⁴ in searching for customers and suppliers, comparing supplier prices, ordering and managing inventory, designing products, communicating with counterparts, corresponding with stakeholders, travelling, conducting meetings, recruiting staff and running marketing campaigns.⁹⁵

Fuel efficiency on the road is central to UPS's profitability. Using digital technologies that enable remote control and monitoring from its corporate offices, technology centres and hubs, UPS has developed a number of programmes such as Preventive Maintenance Inspections, Package Flow Technologies and Delivery Information Acquisition Device to help drivers optimise delivery routes and their vehicles operate at optimal levels with better fuel economy.⁹⁶ Otis allowed registered users to review the entire service history of their elevators on its website, and also had a planning service that allowed customers to design and plan their next elevator project. This had greatly reduced the cycle time for planning and increased the efficiency of transaction.⁹⁷ The advent of online recruitment sites like Jobsite, Jobs.ac.uk and Reed has helped many firms, especially smaller ones, economise on recruitment costs by circumventing agencies or even classified sections in local or national newspapers. Micro-firms take this a step further by efficiently advertising for vacant positions on popular local bulletin boards such as Gumtree.

⁹² Williamson, O.E. (1983), "Organizational innovation: The transaction cost approach", in Ronen, J. (ed.), *Entrepreneurship*, Lexington, MA: Lexington Books.

⁹³ Coase, R. (1937), "The nature of the firm", *Economica*, 4(16): 386-405; Williamson, O.E. (1975), *Markets and Hierarchies, Analysis and Antitrust Implications: A Study in the Economics of Internal Organization*, New York, NY: Free Press.

⁹⁴ These could be financial, time, effort and energy costs, as well as various opportunity costs.

⁹⁵ Dyer, J.H. (1997), "Effective interfirm collaboration: How firms minimize transaction costs and maximize transaction value", *Strategic Management Journal*, 18(7): 535-56; Lucking-Reiley, D. and Spulber, D.F. (2001), "Business-to-business electronic commerce", *Journal of Economic Perspectives*, 15(1): 55-68.

⁹⁶ "UPS uses technology and operational efficiencies to reduce fuel consumption and emissions", UPS website, available at <http://www.pressroom.ups.com/Fact+Sheets/ci.UPS+Uses+Technology+and+Operational+Efficiencies+to+Reduce+Fuel+Consumption+and+Emissions.print>, accessed on 10 Sept 2012.

⁹⁷ Becker, M., Lachenauer, R. and Williams, D. (2001), *How the Internet Can Boost Your Brand*, Boston, MA: The Boston Consulting Group.

Efficiency enhancements that lead to the lowering of transaction costs can also be realised in a couple of other ways: scale economies, as digital technologies enhance a firm's global retail reach via its website; and faster and better informed decision-making via ever cheaper interconnectivity and higher speeds with which information can be transmitted. Search engines that have become part of the furniture on the web, have significantly reduced search costs, but would never have been possible in the physical world. Neither can the likes of eBay and Facebook exist in the physical world – manually coordinating a global network is both arduous and inefficient, if not impossible. Increased transaction cost efficiency in the digital economy has also revolutionised business models, and has enabled firms to move from value chains to virtual value networks. Virgin Mobile and Tesco Mobile are just two examples in the mobile communications sector. Known as 'virtual operators', they are run on the T-Mobile-Orange and O2 networks respectively, while drawing on their strengths in other parts of the value chain, for example, marketing and distribution. Many online insurance firms likewise maintain both a virtual front (eg website, brand) and virtual value networks (eg underwriting insurers, outsourced data centres).

However, transaction relationships within networks are complex and sometimes conflicting. Firms traditionally seek to economise on every single transaction. However, transactions underpinning network operations are carried out not in isolation but in an interconnected manner, which may lead to conflicts. An example is the online music industry. Even if music producers and internet service providers distributing content to end users can both benefit from transaction cost efficiency online, it is still difficult and contentious to agree on who shall pay for the copyright enforcement online.⁹⁸ Furthermore, it is not uncommon that online transaction costs sometimes actually increase. The La Redoute example earlier is a case in point.

Relational optimality

Because of the highly networked nature of the modern economy and the increasing prominence of intangibles as new sources of value creation, strong and effective intra- and inter-firm relationships have become more important than ever as one of the keys to competitive advantage. In many respects, these relationships – in effect, the 'intangible of intangibles' – hold many of the other intangible factors together. For instance, the effective use of firm-specific resources depends to a large extent on how well people can work together, which is a function of the health of relationships within the firm. The success of a firm's networks – be they virtual networks involving online customers and reviewers, or supply chain and innovation networks involving other firms – hinges, *ceteris paribus*, on trust, commitment and participation among network members.

Strong and effective relationships within an organisation are crucial for high performance. They are often a pre-requisite for trust, participation and cooperative behaviour, mutual respect, a sense of belonging and unity, positive morale, altruism, and willingness to go the

⁹⁸ See Sissons, A. (2011), *op. cit.*

extra mile. These usually translate into higher productivity, the flourishing of ideas for innovation and improved all-round performances.⁹⁹ The richest plethora of resources and the most dynamic of capabilities will be of little use if dysfunctional intra-firm relationships prevent their proper exploitation. Likewise, strong and effective inter-firm relationships enhance cooperation and reduce conflicts, and have been found to directly improve revenues and profits, reduce costs, expand markets and drive innovation.¹⁰⁰

Recent parlance on relationships has focused substantially on social capital. Social capital refers to the features of social organisations, such as networks, that facilitate coordination and cooperation for mutual benefit. It can also be viewed as the collective value of all social networks and the inclinations that arise from these networks to do things for each other.¹⁰¹ This implies that relationships are indeed fundamental to social capital, and that social capital can be a means to achieve higher ends. Social capital has been used to explain superior managerial performance,¹⁰² improved performance of functionally diverse groups,¹⁰³ and enhanced performance of the supply chain.¹⁰⁴ Thus, social capital embedded in productive networks is very much an asset that can potentially translate into a source of competitiveness. It is, however, intricately tied to how people, or by extension firms, relate to each other and help each other achieve, which of course points to the need to understand what drives relationships.

Studies have suggested various relationship drivers of firm performance and competitiveness, including commitment and trust,¹⁰⁵ exchange dependence structure,¹⁰⁶ direct effects of relational norms,¹⁰⁷ and, as discussed earlier, the relational effects of transaction cost economics.¹⁰⁸ A more comprehensive paradigm that encapsulates these

⁹⁹ Albrecht, T.L. and Hall, B.J. (1991), "Facilitating talk about new ideas: The role of personal relationships in organizational innovation", *Communication Monographs*, 58: 273-88; Gardner, D.G. and Pierce, J.L. (1998), "Self-esteem and self-efficacy within the organizational context", *Group and Organization Management*, 23(1): 48-70; Weinreb, M. (2003), "Power to the people," *Sales & Marketing Management*, 155(4): 30-5.

¹⁰⁰ Cannon, J.P. and Homburg, C. (2001), "Buyer-supplier relationships and customer firm costs", *Journal of Marketing*, 65(1): 29-43; Palmatier, R.W., Gopalakrishna, S. and Houston, M.B. (2006), "Returns on business-to-business relationship marketing investments: Strategies for leveraging profits", *Marketing Science*, 25(5): 477-93; Rindfleisch, A. and Moorman, C. (2001), "The acquisition and utilization of information in new product alliances: A strength of ties perspective", *Journal of Marketing*, 65(2): 1-18; Palmatier, R.W., Dant, R.P. and Grewal, D. (2007), "A comparative longitudinal analysis of theoretical perspectives of interorganizational relationship performance", *Journal of Marketing*, 71(4): 172-94.

¹⁰¹ Bourdieu, P. (1986), "The forms of capital", in Richardson, J.G. (ed.), *Handbook of Theory and Research for the Sociology of Education*, New York, NY: Greenwood; Putnam, R.D. (1995), "Bowling alone: America's declining social capital", *Journal of Democracy*, 6(1): 65-78; Putnam, R.D. (2000), *Bowling Alone: The Collapse and Revival of American Community*, New York, NY: Simon and Schuster.

¹⁰² Moran, P. (2005), "Structural vs. relational embeddedness: Social capital and managerial performance", *Strategic Management Journal*, 26(12): 1129-51.

¹⁰³ Evans, W.R. and Carson, C. (2005), "A social capital explanation of the relationship between functional diversity and group performance", *Team Performance Management*, 11(7/8): 302-15.

¹⁰⁴ McGrath, R. and Sparks, W.L. (2005), "Supply chain management: The importance of building social capital", *Quality Progress*, 38(2): 45-9.

¹⁰⁵ Morgan, R.M. and Hunt, S.D. (1994), "The commitment-trust theory of relationship marketing", *Journal of Marketing*, 58(3): 20-38.

¹⁰⁶ Hibbard, J.D., Kumar, N. and Stern, L.W. (2001), "Examining the impact of destructive acts in marketing channel relationships", *Journal of Marketing Research*, 38(1): 45-61.

¹⁰⁷ Lusch, R.F. and Brown, J.R. (1996), "Interdependency, contracting, and relational behavior in marketing channels", *Journal of Marketing*, 60(4): 19-38.

¹⁰⁸ Parkhe, A. (1993), "Strategic alliance structuring: A game theoretic and transaction cost examination of interfirm cooperation", *Academy of Management Journal*, 36(4): 794-829; Wathne, K.H. and Heide, J.B. (2000), "Opportunism in interfirm relationships: Forms, outcomes, and solutions", *Journal of Marketing*, 64(4): 36-51.

and other disparate drivers of relationships is relational optimality. The strength and effectiveness of intra- and inter-firm relationships that provide a basis for competitive advantage depend on the optimisation of five interrelated drivers – directness, commonality, multiplexity, parity and continuity.¹⁰⁹

Within the firm, optimal levels of directness in communication are crucial for team-working, coordination and efficiency. This is particularly important in the digital age where remote or off-site working, constant mobility and interaction using ICT are often necessary. The same issues are prevalent, if only magnified, when it comes to inter-firm communications. The richer, non-verbal cues detectable in less mediated forms of communication, such as face-to-face contact, enable candid and quick exchange of ideas, and minimise the possibility of messages getting lost in interpretation or being wrongly decoded, thus avoiding misunderstandings further down the road that can sour relationships. Corning, the manufacturer of glass and ceramics, discovered that 80% of their innovative ideas came from face-to-face contact, and that the engineers were only willing to walk a maximum of 100 feet from their desks to talk to somebody else.¹¹⁰ The Norwegian telecommunications giant Telenor discovered an increase in inter-department communication, efficiency and overall firm competitiveness ever since a flatter organisational structure and open-plan offices were implemented to promote more direct communication.¹¹¹ In theory, the clustering of similar or related firms within an industry defies the logic of the irrelevance of location in the digital age characterised by high connectivity. Yet, the ‘social glue’ that binds clustered firms together actually facilitates access to important resources and information, all of which are critical for firm competitiveness.¹¹²

Speed, agility and diversity are central to firms’ operations in the digital economy. That which is pivotal in ensuring multi-talented, functionally disparate or geographically dispersed teams still sing from the same corporate hymn sheet despite operating at breakneck pace is commonality – collaborating parties that share a strong sense of common purpose are more inclined to pull together in the same direction. Firm competitiveness and performance are often built on the foundations of effective relationships governed by a strong sense of shared purpose, which not only provides direction and momentum, but also influences members’

¹⁰⁹ These drivers were first suggested as five ‘dimensions’ of relationships in Schluter, M. and Lee, D.J. (1993), *The R Factor*, London: Hodder and Stoughton, and later referred to collectively as ‘relational proximity’ in Schluter, M. and Lee, D.J. (2009), *The Relational Manager: Transform Your Business and Your Life*, London: Lion Hudson. However, the concept of relational proximity implies the maximisation, instead of optimisation, of each of the five dimensions.

¹¹⁰ Cohen, D. and Prusak, L. (2001), *In Good Company: How Social Capital Makes Organizations Work*, Boston, MA: Harvard Business School Press.

¹¹¹ “Telco supremo”, *The EDGE*, 18 May 2009, available at <http://www.theedgemaalaysia.com/lifestyle/14565-cover-telco-supremo.pdf>, accessed on 4 Dec 2009.

¹¹² Michael Porter articulates this succinctly: “Tapping into the competitively valuable assets within a cluster requires personal relationships, face-to-face contact, a sense of common interest, and insider status. Geographic, cultural, and institutional proximity leads to special access, closer relationships, better information, powerful incentives, and other advantages in productivity and innovation that are difficult to tap from a distance.” See Porter, M.E. (1998), “Clusters and the new economics of competition”, *Harvard Business Review*, 76(6): 77-90. The growth of the Cambridge and the Silicon Roundabout clusters has continued to support this argument.

commitment.¹¹³ Part of Southwest Airlines' and AirAsia's ability to perform better than industry competitors over a sustained period of time was attributed to their ability to galvanise employees through a common purpose of, frivolous as it may sound to some critics, having fun on the job.¹¹⁴ The establishment of a shared purpose and vision was also critical to the success of post-merger integration between General Electric and Marquette Medical Systems, two firms with very different cultures.¹¹⁵ The success of the Japanese *keiretsus*, with their very strong sense of shared purpose, is a good example of the importance of inter-firm commonality.

People within a given network are sometimes involved in more than one relationship with each other, the most common of which is the intertwining of professional relationships and friendships. Multiplexity is the degree to which people are connected through more than one relationship, and exists between two parties when they each play two or more roles vis-à-vis one another, or relate to each other in multiple contexts.¹¹⁶ Social exchanges within firms, some of which may lead to the formation of informal networks, can span business units, departments or functions, and often occur in a fuzzy and disorganised manner beyond managers' knowledge or control. Strong multiplex relationships can also facilitate knowledge sharing in organisations. A study found that up to 70% of all workplace learning was informal, and occurred in a variety of situations including casual interactions, or small talk, with peers.¹¹⁷ Xerox engineers and technicians discovered that, as a result of no longer being based at a common depot, they suffered a decline in productivity that was attributable to the lack of opportunities to engage in multiplex exchanges that were somehow a hotbed for knowledge exchange. While eating, playing cards and engaging in what seemed like idle gossip during and after working hours, they continuously talked about work, posing questions, raising problems, offering solutions, constructing answers and laughing at mistakes.¹¹⁸

Perceived parity breeds engagement. When collaborating parties perceive they are being treated fairly and with respect, they are naturally more inclined to participate, display cooperative behaviour, be trusting and loyal, and even work harder at improving

¹¹³ Mourkogiannis, N. (2006), *Purpose: The Starting Point of Great Companies*, New York, NY: Palgrave Macmillan; Hess, K. (1987), *Creating the High-Performance Team*, New York: Wiley; Scott, K.D. and Townsend, A. (1994), "Teams: Why some succeed and others fail", *HR Magazine*, Aug: 62-7.

¹¹⁴ Friedberg, K. and Friedberg, J. (1996), *Nuts! Southwest Airlines' Crazy Recipe for Business and Personal Success*, Austin, TX: Bard Press; the author's interviews with AirAsia Group CEO Tony Fernandes; "More than a business model", *The Star Online*, 28 Jun 2011, available at <http://thestar.com.my/columnists/story.asp?col=ceritalah&file=/2011/6/28/columnists/ceritalah/8984368&sec=Ceritalah>, accessed on 28 Jun 2011; "Interview: AirAsia CEO Tony Fernandes", *Airline Business*, 18 May 2009, available at <http://www.flightglobal.com/articles/2009/05/18/326659/interview-airasia-ceo-tony-fernandes.html>, accessed on 11 Dec 2009.

¹¹⁵ Able, R.M. (2007), *The Importance of Leadership and Culture to M&A Success*, Washington, DC: Human Capital Institute.

¹¹⁶ Wasserman, S. and Faust, K. (1994), *Social Network Analysis: Methods and Applications*, New York: Cambridge University Press; Valcour, P.M. (2002), "Managerial behavior in a multiplex role system", *Human Relations*, 55(10): 1163-88.

¹¹⁷ Davenport, T.H. and Prusak, L. (1998), *Working Knowledge: How Organizations Manage What They Know*, Cambridge, MA: Harvard Business School Press; Pfeffer, J. and Sutton, R.I. (1999), "Knowing what to do is not enough: turning knowledge into action", *California Management Review*, 42(1): 83-108; Pfeffer, J. and Sutton, R.I. (1999), *The Knowing-Doing Gap: How Smart Companies Turn Knowledge into Action*, Cambridge, MA: Harvard Business School Press.

¹¹⁸ Ambrozek, J. and Ambrozek, L.B. (2002), "Building business value through 'communities of practice'", *Workforce Magazine*, 12 Jan.

productivity.¹¹⁹ Engagement and trust cannot be more important for fast-paced firms competing in the digital economy. The legendary former General Electric Chairman and CEO Jack Welch saw this ahead of time when he sought to enhance the perception of fairness and the levels of trust in the firm by turning GE into a ‘family grocery store’ and a ‘boundaryless organisation’ despite its obvious gargantuan size.¹²⁰ Trust that results from perceptions of fairness has also been found to be key in building successful inter-firm networks that openly share information and knowledge.¹²¹ For firms engaged in open innovation, trust among network members is paramount, and is often predicated on a perception of parity that exists when network members refrain from selfish opportunism. Research suggests that open source communities suffer from major trust issues related to opportunistic behaviour and free-riding.¹²²

Continuity in relationships within the firm, as well as between firms, can have telling effects on firm competitiveness. Even for large firms blessed with deep pockets that are more than capable of absorbing the financial costs associated with employee turnover, the impact of discontinuous relationships will be most significantly felt when they lose employees with extensive social capital, whose departure, as research has found, can dramatically erode firm performance.¹²³ The intangibility of the sources of firm competitiveness in the digital economy means the flight of resources – many of which rests in or revolve around human and social capital – can sometimes make or break firms. Similarly, in inter-firm relationships, particularly where firms collaborate on innovation projects, the time taken for the relationships to develop determines how well firms work together with each other. Continuity allows firms to adapt themselves, generate more synergy and share learning, aided mainly by the development of a better understanding of each other’s cultures, management systems, capabilities and weaknesses.¹²⁴

Contrary to conventional wisdom, optimising these five drivers of relationships is actually more important than maximising them for the purpose of gaining competitive advantage. In a case of sometimes less is more, maximum directness – for example, face-to-face meetings among network members instead of video conferencing even when there is no substantial agenda on the table – may be an unnecessary waste of resources and may only foster inefficiencies. Extreme levels of shared vision and the lack of dissenting voices may drive the whole network, or partnerships, down blind alleys. Kodak and its network of suppliers are a case in point.

¹¹⁹ Kim, W.C. and Mauborgne, R.A. (1991), “Implementing global strategies: the role of procedural justice”, *Strategic Management Journal*, 12(4): 125-43; Tyler, T.R. and Lind, E.A. (1988), *The Social Psychology of Procedural Justice*, New York: Plenum; Konovsky, M.A. and Pugh, S.D. (1994), “Citizenship behavior and social exchange”, *Academy of Management Journal*, 37(3): 656-69.

¹²⁰ Day, C., Jr. and LaBarre, P. (1994), “GE: just your average everyday \$60 billion family grocery store,” *Industry Week*, 2 May: 13-8.

¹²¹ Church, M., Bitel, M., Armstrong, K., Fernando, P., Gould, H., Joss, S., Marwaha-Diedrich, M., de la Torre, A.L. and Vouhe, C. (2003), “Participation, relationships and dynamic change: New thinking on evaluating the work of international networks”, Working Paper No.121, University College London.

¹²² Andersen, B. and Rossi, F. (2011), *op. cit.*

¹²³ Shaw, J.D., Duffy, M.K., Johnson, J.J. and Lockhart, D. (2005), “Turnover, social capital losses, and performance”, *Academy of Management Journal*, 48(4): 594-606.

¹²⁴ Doz, Y.L. (1996), “The evolution of cooperation in strategic alliances: Initial conditions or learning processes”, *Strategic Management Journal*, 17(1): 55-83; Peroune, L.D. (2007), “Tacit knowledge in the workplace: The facilitating role of peer relationships”, *Journal of European Industrial Training*, 31(4): 244-58.

At the same time, firms with strong relationships in certain networks may also benefit from having weak relationships in other networks. In what is known as the 'strength of weak ties',¹²⁵ firms stand to gain a wider pool of ideas, or develop more distant but nonetheless useful contacts, through their wider, albeit, weaker networks. This is partly based on the thinking that firms with few weak ties will be deprived of information from distant parts of the social network, and will instead be subjected to the risks of inbreeding and groupthink within the stronger networks. From the Bay of Pigs fiasco and the Challenger space shuttle disaster to the setbacks of both British Airways' and Marks and Spencer's internationalisation strategies, groupthink has been cited as a key factor.¹²⁶

¹²⁵ The idea of the strength of weak ties was first proposed to describe an individual's job change or advancement prospects based on the strength of his ties within the social system, or labour market. See Granovetter, M. (1973), "The strength of weak ties", *American Journal of Sociology*, 78(6): 1360-80; Granovetter, M. (1983), "The strength of weak ties: A network theory revisited", *Sociological Theory*, 1: 201-33.

¹²⁶ Janis, I.L. (1982), *Groupthink*, Boston, MA: Houghton Mifflin; Moorhead, G., Ference, R. and Neck, C.P. (1991), "Group decision fiascos continue: Space shuttle Challenger and a revised groupthink framework", *Human Relations*, 44(6): 539-50; Eaton, J. (2001), "Management communication: The threat of groupthink", *Corporate Communication*, 6(4): 183-92.

3. Conclusions

The digital economy has brought disruptive forces to the fore and created a new normal in which firms compete. In the proverbial new playground and new game, firms can now find new ways to create, deliver and capture value, or reinvent their business models. But those that have either been slow to adapt or failed to grasp the new keys to unlock growth have found themselves at best losing ground to rivals and at worst battling for survival.

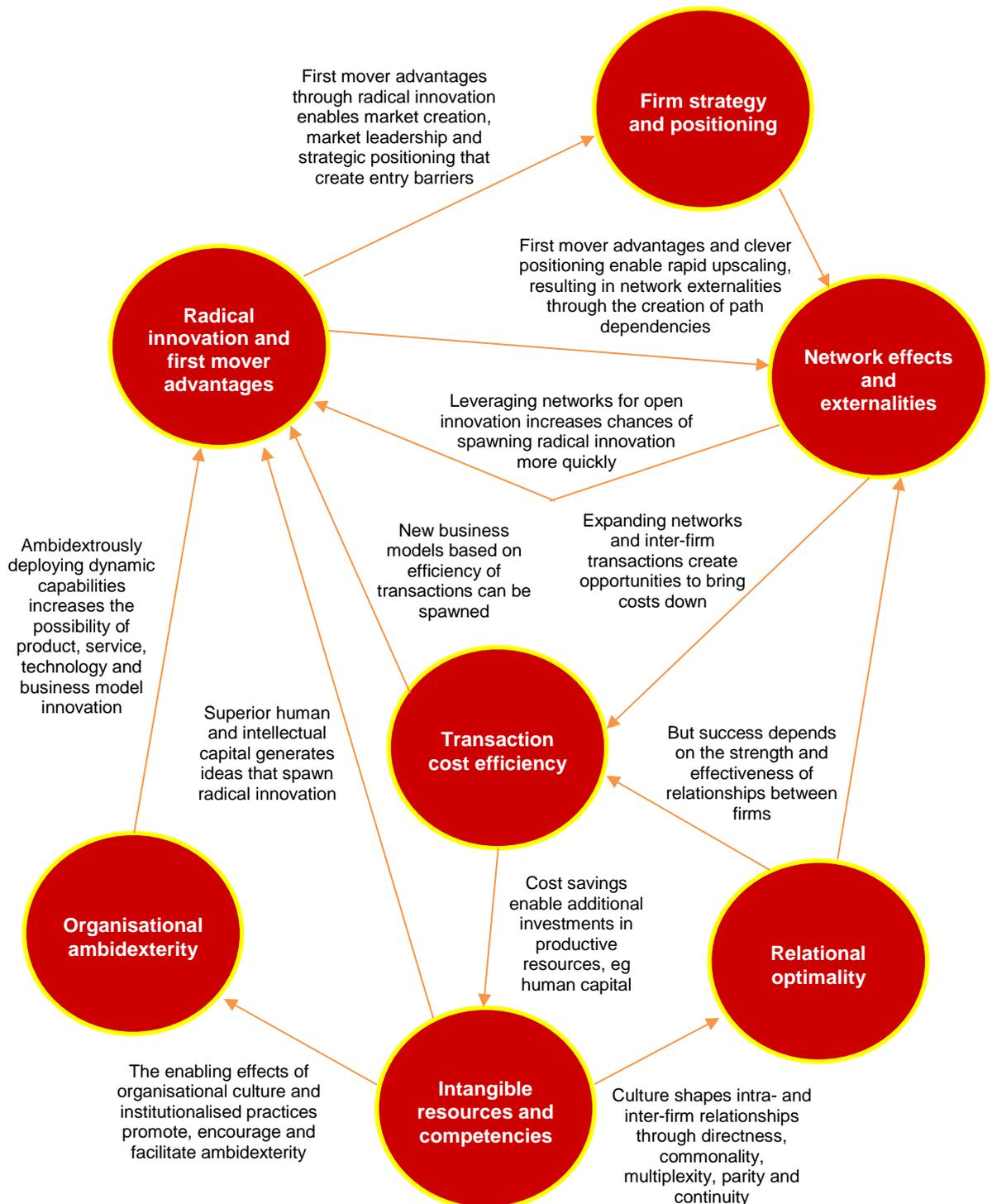
Radical change in the environment requires a radical response. Firms have relied for too long on familiar and tangible sources of value creation to drive competitiveness. In the new normal, however, firms can no longer compete simply on the basis of greater access to and efficiency of traditional factors of production, ie land, raw materials, labour and capital, or clever strategies that revolve around these. The name of the new game is intangibility. Firms seeking to grow and thrive in the digital economy must instead tap into seven key intangible sources of competitive advantage: *firm strategy and positioning, radical innovation and first mover advantages, intangible resources and competencies, organisational ambidexterity, network effects and externalities, transaction cost efficiency, and relational optimality.*

Complementarities of sources

These seven sources of competitive advantage in the digital economy are in effect interconnected and complementary (see Figure 2). Being a first mover as a result of radical innovation naturally makes it easier to establish new markets and thereby create barriers to market entry, through some form of IP protection for example. It may also enable the pioneer to quickly establish a market stranglehold and rapidly upscale, resulting in the creation of a series of network externalities and path dependencies that, due to the resulting high switching costs, prevent customers from defecting.

As value chains evolve to become complex value networks, the number of inter-firm transactions likewise increases exponentially. Besides the profound implications this has on transaction cost efficiency, the success of these transactions and networks are heavily dependent on the strength and effectiveness of the relationships between member firms. Also, the extent to which firms are ambidextrous enough to deploy their dynamic capabilities is partly dependent on the enabling effects of their organisational culture, which is an intangible firm-specific resource. Culture can likewise impact on relational optimality within the firm, as well as between firms, by either facilitating or reducing directness, commonality, multiplexity, parity and continuity.

Figure 2: An illustrative example of the interconnections and complementarities among the seven intangible sources of competitive advantage



Firms that are known as ‘high-velocity organisations’ are capable of learning and improving at speed. Such firms are well placed to acquire and deploy their dynamic capabilities to simultaneously explore and exploit innovation opportunities. Being ambidextrous as such, they significantly enhance their chances of capturing first mover advantages through some form of radical innovation. Because they are quick, they are also able to effectively create barriers to imitation by continuously innovating ahead of copycats, leaving imitators struggling to keep up.¹²⁷

Hibu, the publisher of the Yellow Pages and formerly known as Yell, is an example that illustrates how complementarities, or the lack of them, can conspire to pose real challenges for firms. It floated on the London Stock Exchange in 2003 with market capitalisation of approximately £2 billion, but a lack of ambidexterity and flexibility in adapting to dramatic changes in the marketplace and failure to quickly reposition itself online when classified advertisers migrate online have resulted in earnings decline. Its current net debt of £2.2 billion makes its £16.2 million market capitalisation (at the time of writing) look miniscule, and the on-going restructuring may destroy all shareholder value.¹²⁸

Harnessing the potential complementarities of these seven intangibles is the key to competitive advantage in the future. It is about smartly combining and configuring several or all of these intangibles to create new value and drive business model innovation.

The many paths to success... and failure

Just like many of the characteristics of the digital economy, the sources of firm competitive advantage are intangible and manifold. Although tangible resources, or traditional factors of production, ie land, raw materials, labour and capital, are less tied up in localised assets and can easily be traded, it is the more elusive intangible resources that enable firms to carve a competitive edge. Nokia, for example, has generated positive net cash from its operations, and can boast of net and gross cash reserves of €4.2 billion and €9.4 billion respectively.¹²⁹ But it has found itself in a turnaround mission after largely missing the smartphone revolution that has seen its rivals Apple and Samsung, both of whom have excelled in the intangibles, capture significant market share.

While firm strategy and positioning, radical innovation and first mover advantages, intangible resources and competencies, organisational ambidexterity, network effects and externalities, transaction cost efficiency, and relational optimality can be highly valuable sources of value creation in the digital age, it is also clear that sustainable competitiveness can only be found in the synergistic effects obtained from harnessing these sources collectively. The complementarities of these sources demand a holistic approach.

¹²⁷ Spear, S.J. (2009), *The High-Velocity Edge: How Market Leaders Leverage Operational Excellence to Beat the Competition*, New York, NY: McGraw-Hill.

¹²⁸ “Hibu warns its shares could be worthless”, *FT.com*, 19 Sept 2012, available at <http://www.ft.com/cms/s/0/1646a5f4-0223-11e2-b41f-00144feabdc0.html#axzz282uiq7wj>, accessed on 1 Oct 2012.

¹²⁹ “Case study: Nokia seeks better connection in survival fight”, *FT.com*, 20 Sept 2012, available at <http://www.ft.com/cms/s/0/5d1958f2-f678-11e1-9dff-00144feabdc0.html#axzz282uiq7wj>, accessed on 27 Sept 2012.

The various possible configurations of these seven sources also imply that complementarities can emerge in different forms and ways. As discussed earlier, the digital economy is in effect an extension of the real economy, transcends e-business, and is certainly much more than just virtual firms, or pure-plays, making money on the web. Because the impact of the digital economy is sufficiently wide and deep such that it affects every sector to a greater or lesser extent, it follows then that differently configured sources may yield different guises of competitiveness, the variability of which further increases when one takes into account different sectors and markets.

Box 2: At the crossroads in the new normal: BlackBerry and the speed of its decline

The speed, scale and magnitude of change in the digital economy can leave even the most reputable firms and the strongest brands battling to stay in the game, if not for survival altogether.

It is a firm whose products still have more than 80 million users and that, until relatively recently, was a market leader. BlackBerry (the firm previously known as Research in Motion) used to own the corporate market. BlackBerry phones were once a device that business executives, lawyers, bankers, government officials relied on for email while on the move. Its founder Mike Lazaridis confidently predicted in 2003 that “the cameraphone will be rejected by corporate users”. But BlackBerry failed to accurately feel the pulse of the market, technological trends and changes in consumer tastes. Sitting comfortably on its competitive advantage in what it believed to be a sustainable niche market cost BlackBerry dearly. A convergence of work and play was heralded by new generations of smartphones produced by Apple and Samsung. Even the high-flying executive is increasingly eschewing the BlackBerry in favour of an iPhone. Developers are more interested in making apps for the iOS, Android and, increasingly, Windows Phone.

BlackBerry’s failure to innovate quickly enough, as exemplified by the successive delays in the launch of its BlackBerry 10, put paid to its competitive edge. The firm posted a loss of US\$235 million for the three months to the end of August 2012, in stark contrast to a profit of US\$329 million in the same quarter of the previous year. Shares that once traded at over US\$140 were at one point hovering around US\$7.25. Its global market share fell below 5%; it had 12% of the market a year earlier. That compared with 23% for Apple and 59% for the range of phones using Google’s Android. It cut its workforce to around 11,000, down from nearly 20,000 just a few years ago. While not quite in its death throes as some fierce critics have (rather wrongly) proclaimed, BlackBerry nonetheless is staking its future on the success of its new operating platform and a lineup of new phones.

Sources: “Saving BlackBerry from its ‘deathbed’”, *The Telegraph*, 14 Jul 2012, available at <http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/electronics/9400106/Saving-BlackBerry-from-its-deathbed.html>, accessed on 10 Aug 2012; “BlackBerry is not in a trough’ – RIM CEO Thorsten Heins interview”, *The Telegraph*, 2 Aug 2012, available at <http://www.telegraph.co.uk/technology/blackberry/9441949/BlackBerry-is-not-in-a-trough-RIM-CEO-Thorsten-Heins-interview.html>, accessed on 8 Aug 2012; “BlackBerry tells developers: ‘we are fighting’”, *The Telegraph*, 27 Sept 2012, available at <http://www.telegraph.co.uk/technology/blackberry/9568998/BlackBerry-tells-developers-we-are-fighting.html>, accessed on 28 Sept 2012.

All these underscore a two-pronged argument. One, the path to competitiveness in the digital economy is indeed varied. That which determines whether firms succeed or fail is often how optimally the sources of competitiveness are configured to harness their complementarities. In simple terms, there is no silver bullet. Two, the reverse is equally true. There are likewise many routes that lead to failure. Firms may discover that weakness in just one critical source, relational optimality for instance, may be detrimental to their competitive edge even when they have an abundance of several other sources. Kodak is a good example to return to. Being the leader in the 35mm film market, its transaction cost efficiency and strong network effects can hardly be questioned. But failure to radically innovate its business model to take advantage of then nascent digital technologies – a factor that can perhaps be partly attributed to the lack of organisational ambidexterity – put paid to its competitive advantage.

An ecosystem approach to strategy

Owing to the complementarities of these sources and the many possible paths that lead to success or failure, it is highly imperative for business leaders and executives to adopt an ‘ecosystem’ approach to formulating business strategy and reinventing business models in the light of the new normal. This refers to the need to take a holistic view of all seven intangible sources of competitive advantage and consider how, as intricately-linked components of an ecosystem, they might combine to strategically complement each other in creating, delivering and capturing value. As suggested above, the manifest value of these new sources lies in their complementarities, thus implying that smart configurations of these in ways appropriate to the firm’s industry and line of business are capable of helping the firm gain and sustain competitive advantage.

What is also clear is that competing in the new normal necessitates, to a lesser or greater extent, some reinvention of business models at some point in the evolution of the markets where a firm competes. As market dynamics change, firms must either reactively ensure their business models are at least capable of keeping up or proactively innovate their business models to create new markets and blue oceans.¹³⁰

Another key area in strategic management is the valuation of firms and their business models for financing purposes that range from going public to mergers and acquisitions. It is no longer optimal for firms playing an active and integral role in the digital economy to be valued by merely their physical assets (plus traditional accounting intangibles such as goodwill). Instead, it is increasingly evident that new ‘intangible assets’ such as the firm’s intellectual capital and network capital have increased in importance, particularly for firms in

¹³⁰ For more extensive exposition of “blue and red oceans”, see Kim, W.C. and Mauborgne, R. (1999), “Creating new market space”, *Harvard Business Review*, 77(1): 83-93; Kim, W.C. and Mauborgne, R. (2005), *Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant*, Cambridge, MA: Harvard Business School Press.

certain knowledge-intensive sectors and e-business. For instance, while Microsoft's current book value is US\$66.36 billion, the value of its intellectual capital alone is US\$194.99 billion.¹³¹ There is also a marked increase in dematerialisation of manufacturing activities. Many manufacturing firms now invest heavily in intangibles such as research and development capabilities, marketing and distribution, and management of IP through patents and copyrights. Moreover, given that SMEs adopt less formal, if any, IP protection compared to larger firms, metrics used for valuing firms and their intangibles should account for these different approaches and how they might impact on firm value.

Despite the fact that intangible assets that are used in the production process are idiosyncratic in nature and, by definition, difficult to quantify,¹³² this calls for the need to accord greater and more sophisticated recognition to intangible assets, perhaps through the institutionalisation of some new principles for firm valuation, derived from the firm's ecosystem of intangible sources of competitiveness.

Going forward

The new strategic framework set out in this paper also provides the basis for further research. It is envisaged that a large-scale, methodologically rigorous study will be designed and undertaken in collaboration with Big Innovation Centre partners, culminating with the development of a modern taxonomy of new business model drivers in the digital economy, taking into account differences that occur in various industries and sectors.

Such taxonomy, which represents a new synthesis of the complementarities of sources of firm competitiveness, will be particularly useful for practice. It will provide cutting-edge thought leadership that informs business leaders and executives of the critical factors they need to consider as their firms compete in the rapidly evolving digital economy. As it also breaks a path in hitherto uncharted territory in both academic and practitioner-orientated literature, it is capable of helping business leaders and executives stay ahead of the game. More importantly, key learning derived from this future joint-research will help businesses identify how they might reinvent their business models to compete more effectively.

In short, the seven new sources of competitive advantage set out in this paper are in many ways a double-edged sword. While they can prove to be lethal to the firm's competitiveness and survival, they can also be strategically harnessed to win in the digital economy.

¹³¹ The value of intellectual capital is considered to be the difference between the firm's stock market value and its book value. See Stewart, T.A (1997), *Intellectual Capital: The New Wealth of Organizations*, New York, NY: Doubleday/Currency. Microsoft's market capitalisation is US\$261.35 billion. All figures at the time of writing obtained from FT.com, available at <http://markets.ft.com/research/Markets/Companies-Research>, accessed on 19 Sept 2012.

¹³² This is not to suggest that there is currently a dearth of useful methods to measure intangible assets. For example, four categories of measurement, namely Direct Intellectual Capital methods (DIC), Market Capitalisation Methods (MCM), Return on Assets methods (ROA), and Scorecard Methods (SC) are proposed in Sveiby, K.E. (2001), "A knowledge-based theory of the firm to guide in strategy formulation", *Journal of Intellectual Capital*, 2(4): 344-58. What is imperative, though, is the need for a holistic framework that can more comprehensively measure intangible assets that are derived from multiple sources of competitive advantage in the digital economy.

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