

Corporate Strategy and the Theory of the Firm in the Digital Age

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ABSTRACT The purpose of this article is to reinvigorate research in the intersection of corporate strategy and the theory of the firm in light of the rapid advancement of digital technologies. Using the theory of the firm as an interpretive lens, we focus our analysis on the implications of the emerging digital age for three broad domains of corporate strategy: (1) corporate (competitive) advantage, (2) firm scale, scope, and boundaries, and (3) internal structure and design. Recognizing that digitalization exacerbates ambiguity and paradoxes, we sketch foundational strategies for future research. We suggest that there is a need to develop knowledge that accounts for the new realities of the digital age, depending on whether the corporate strategy phenomena under investigation and the theories of the firm used to explain them, are existing or new. The article serves also as introduction to the *Journal of Management Studies* Special Issue on the topic.

Keywords: corporate strategy, digitalization, digital transformation, multi-business firm, scale and scope, theory of the firm

INTRODUCTION

As the global economy transforms from its electro-mechanical and analogue origins into an electronic and digital form, it is no surprise that the role of the firm as the fundamental unit for the organization of economic activity has been evolving. Indeed, the emergence of the ‘digital age’ fundamentally challenges our understanding of the nature and functioning of multi-business firms – both in terms of their corporate strategies as

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well as theories that shed light on their existence, behaviour, and performance (Adner et al., 2019; Birkinshaw, 2018; Foss, 2005; Kunisch et al., 2020a; Lanzolla et al., 2018; Levinthal, 2019; Volberda et al., 2021).

Corporate strategy has been a central topic in management research and practice since the early days of the field (Andrews, 1971; Barnard, 1938; Rumelt et al., 1994). It has become one of the most researched topics in strategy (Feldman, 2020) and the subject of some of the most widely taught courses in business and management programmes (Alcacer et al., 2021). Addressing the issue of how firms create value across markets – rather than how they build competitive advantage within a single business – corporate strategy focuses on the *raison d'être* of the multi-business firm; the appropriate scope of the firm; how diversified companies are effectively organized and managed; as well as specific topics, such as mergers and acquisitions, divestitures, alliances, vertical integration, and the role of headquarters (Chandler, 1962; Collis and Montgomery, 1998).

While research into corporate strategy draws from a wide range of theories to explain the scope, management, and evolution of diversified firms, the theory of the firm has historically been a key tool of inquiry (Rumelt, 1991; Rumelt et al., 1994) (for a collection of the core contributions to the theory of the firm, see Foss, 2000). A particularly influential version is rooted in the thinking of economics Nobel Prize Laureates Ronald Coase (1937), Oliver Williamson (1975), and Oliver Hart (1995). Here, the firm is seen as a 'governance structure' with a cluster of complementary attributes – the existence of employment contracts, managerial hierarchies, concentration of decision rights over productive assets, and the use of relatively 'soft' incentives and the implicit contract law of 'forbearance' to regulate transactions (Williamson, 1996). In this perspective, the firm is regarded as a way of allocating resources that differs from allocation of resources by means of prices and contracts. Theorists of the firm have, for example, explored the basic reasons why firms exist, the boundaries of the firm *vis-à-vis* markets (Coase, 1937; Teece, 1982; Williamson, 1975, 1985), and the internal organization of firms (Teece, 1982) – abstract themes that, however, have direct implications for our conceptualization and understanding of corporate strategy.

However, many other conceptualizations of the nature of the firm exist, some based on the behavioural theory of the firm (Cyert and March, 1963; Gavetti et al., 2012), some based on notions of firms as specialized collections of heterogeneous resources (Barney, 1991; Demsetz, 1973), and others again stressing the nature of firms as knowledge-based and learning entities (Helfat et al., 2009; Penrose, 1959; Teece et al., 1997). Diverse issues such as of property rights and contract laws, decision-making, as well as sociological and psychological notions of culture and identity, are intertwined with the above perspectives. Thus, the theory of the firm is a broad, heterogeneous landscape with multiple local peaks represented by different perspectives that have different origins, conceptualize the firm differently, and deal with different aspects of the firm. As a recent contribution clarifies, there is no clear-cut consensus on some of the most basic questions, such as the very definition of a firm (Walker, 2021). The result is clusters of approaches based on their disciplinary allegiance and the specific questions they investigate. Still, some consensus does exist.

Notably, most theories of the firm would agree on the role of technology as a critical determinant of the boundaries of the firm, its functioning, and its effective management.

In his landmark article, Coase (1937) pointed to a core technology of his day, the telephone, in shaping firm boundaries. Likewise, Chandler (1962) noted that the consolidation of industries in large, vertically integrated companies and the emergence of the Multidivisional form (M-form) structure was driven by adoption of electrical and chemical technologies discovered in the late 19th century. And the factory itself only emerged during the industrial revolution when firms were first able to exploit water and steam power in a single location (McCraw, 1998). What is less clear is how *digital* technologies affect corporate strategy, and the economic, sociological, and behavioural foundations of the firm.

Observers have drawn many conclusions and made many inferences about the impact of digitalization resulting from anywhere, anytime communication supporting frequent, low friction, customized interactions among vast interconnected networks (Anand, 2016; Siggelkow and Terwiesch, 2019). The advent of digital technologies, such as blockchain to regulate cooperation and participation; the use of digital platforms, like videoconferencing to coordinate activities; and the broad availability of mobile devices among others have led many to speculate that firm boundaries and corporate hierarchies will undergo drastic change (Foss and Klein, 2022). The emergence of ecosystems including a broad array of players in the value net; the appeal of multi-sided ‘platform’ business models; and the growing importance of data and its analysis challenge firms’ choice of market positions, vertical and horizontal scope, and the management of those boundaries and internal activities (Adner, 2017; Jacobides et al., 2018).

Such changes engender new phenomena, many of which are not yet understood, and open up important theoretical discussions. Are our theories sufficiently robust to explain new phenomena? Do we need to revise those theories or even develop new theories to explain the emerging phenomena? The purpose of this article is therefore to reinvigorate research on corporate strategy and the theory of the firm in light of the increasing digitalization of the economy. Specifically, we seek to address how digitalization influences corporate strategy, using the theory of the firm as an umbrella term and interpretive lens to identify the mechanisms that link changes in digitalization to changes in corporate strategy. Because of the multifaceted impact that digitalization might have on many different corporate strategy phenomena, we focus on selected changes that are likely to be among the most impactful. In doing so, we incorporate some of the above theories of the firm where they are specifically relevant. However, we recognize that we leave many other important aspects of corporate strategy and the theory of the firm untouched.

This article proceeds as follows. First, we introduce the notion of the ‘digital age’ as a successor to the ‘industrial age’. Next, we move to an in-depth discussion of the implications of the digital age for the field of corporate strategy, focusing on three broad domains, specifically (1) corporate (competitive) advantage, (2) firm scale, scope, and boundaries, and (3) internal structure and design. Finally, we look to the future, sketching out the trajectories and opportunities for researchers in the coming years, considering whether the corporate strategy phenomena under investigation and the theories used to explain them, are existing or new. As part of this discussion, we also introduce the eight articles of this *Journal of Management Studies* Special Issue.

WHAT'S NEW IN THE DIGITAL AGE?

The digital age, also known as the information age, is a historical period, beginning with the advent of computers in the 1960s and continuing to the present day, characterized by rapid increases in the electronic processing and sharing of information. The digital age is enabled by four technologies – computer hardware, software applications, internet and mobile communications, and artificial intelligence (AI) – whose rapid adoption has led to a wholesale change in how individuals interact with one another. These technologies have drastically reduced the costs of searching for, analysing, storing, and sharing information (Foss, 2005). According to an estimate by the International Telecommunication Union (2020), 57 per cent of the worldwide households had internet access and 47 per cent a computer at home at the end of 2019, and 85 per cent of the worldwide population were covered by a 4G mobile-broadband network at the end of 2020.

The digital age has enabled the emergence of a business landscape very different from the industrial age it replaced (Birkinshaw, 2018), in large part because of the ‘economic principles of information’ (Shapiro and Varian, 1999). In particular, these principles suggest that, while the fixed costs of producing information may be high, the costs of using it may be much smaller and the marginal costs of sharing information may be low and declining. This gives a strong incentive to building market share notably through exploiting network externalities. Much of the traditional thinking about competitive strategy (Porter, 1980, 1985) was built on assumptions of oligopolistic competition, but digital markets often have strong network effects, and therefore veer towards winner-takes all scenarios. They therefore involve a different set of responses from competitors and regulators.

Moreover, the vast improvements in operational efficiency made possible through information technology (IT) investments have not been achieved consistently across all firms. Firms that are ‘born digital’ are often an order of magnitude more efficient than traditional firms which operate with a legacy physical infrastructure. For example, Amazon has created a massive shift to online sales from physical retailers such as JCPenney and Macy’s. Indeed, hardly any of today’s unicorn companies could exist without the access to data and some form of digital technology that supports a profusion of business models based on those resources rather than traditional fixed assets.

The high fixed costs and low marginal costs of information products have also affected industry structures. On the one hand is a concentration in the providers of the infrastructure, such as cloud computing and fibre-optic backbone; on the other hand, is an explosion of companies utilizing that infrastructure, offering, for example, applications for smart phones and computers. This high fixed/low variable cost structure, coupled with network effects, has shaped the outcome of market competition, and seemingly rewarded first movers and pre-emptive strategies in markets that ‘tip’ (Gladwell, 2002). However, a more sophisticated understanding of network effects recognizes that only if there are high switching costs, homogeneous consumers and the absence of multi-homing will there be a ‘winner-take-all’ (Cusumano et al., 2019). Notably, these conditions are not always met as, for example, could be observed in the case of MySpace losing out to Facebook.

More generally, connected actors in a digital world become complementors as their products or services increase the value of, or demand for those of another firm (Brandenburger and Nalebuff, 1997). In this market structure, interaction among players introduces the paradox of ‘coopetition’, as firms cooperate with each other to increase the size of the pie, but compete over the size of the pie. For example, competition among standards, which pitches one group of firms against another, makes firm strategies interdependent, such as by establishing an ecosystem (Adner, 2017), in a way that traditional strategic ‘positioning’ considerations do not take into account.

While the effect of the digital age in business-to-consumer (B2C) markets is highly visible, a comparable level of change is also occurring behind-the-scenes in business-to-business (B2B) markets. For example, manufacturing firms now employ countless sensors and numerical controllers in their plants enabling automation of many tasks, predictive maintenance of machines, and continuous improvement in their performance without any human interference. Digital twins of factories now exist, while the interaction with novel physical technologies, like 3D printing (D’Aveni, 2013), further enhances productivity. Combined with machine learning and AI, digitalization now allows a machine to beat every human player at *chess* and *Go* games, and drives efficiencies in activities as varied as domestic electricity consumption to train scheduling.

In sum, digital technologies have led to drastic changes in the nature of firms, competition, and industries and markets. These changes in the digital age affect how multi-business firms can gain a corporate (competitive) advantage and add value through their corporate strategies, as we discuss in detail below. Indeed, one of the frequently-cited (economic) consequences of the digital revolution has been a ‘shake-up’ in the list of the most valuable companies in terms of market capitalization. In 1980, only two ‘tech’ companies, IBM and AT&T were among the ten most valuable firms, alongside GE, Exxon and a range of other industrials. On 31 March 2021 the top ten list featured seven digital firms, Apple, Microsoft, Amazon, Alphabet, Facebook, Tencent, and Alibaba, the first four each with a market value of more than USD 1 trillion.

We acknowledge that other ‘revolutions’ are occurring alongside the transition to a digital age, including the energy transition away from hydrocarbons, and the rapid transformation of bioscience and genetics and of the resulting market convergence (Hsu and Prescott, 2017). The impact of digital technology is enhanced by its interaction with developments in fields such as nanoscience. In addition, the volume, reach, rate, and cost of physical communication went through dramatic improvements before their digital counterparts. In the fifty years since containerization, for example, transportation costs, as a percentage of the value of goods shipped, nearly halved (Hummels, 2007). Therefore, the changes and benefits we observe today are not exclusively due to digitization because the cost and volume of both physical and virtual interactions have shifted exponentially in the last decades.

IMPLICATIONS FOR CORPORATE STRATEGY

Along with the profound impact that digital technologies will have on business and management in general, we expect they will change specifically the corporate strategies through which multi-business firms create value. In the following, we discuss digital

technologies' possible implications for three broad domains that have attracted the most research attention over the years and where the digital revolution might have the most impact: (1) corporate (competitive) advantage (i.e., why some multi-business firms outperform others), (2) firm scale, scope, and boundaries (i.e., what determines the boundaries of the firm), and (3) internal structure and design (i.e., how activities are coordinated within firm boundaries).

Corporate (Competitive) Advantage

Strategy research into the explanation of heterogeneous firm performance has traditionally been conducted at two levels of analysis: the pursuit of competitive advantage by a business unit operating in a specific industry, and the pursuit of corporate/parenting advantage by a multi-business corporation operating across multiple industries (Goold and Campbell, 1987; Porter, 1987). We acknowledge that in the digital age these two levels of analysis can be considered together, as there are both theoretical reasons (economies of scope, a corporate notion, may drive business unit advantages) and practical reasons (many digital firms do not make this distinction) to do this. It is common, for example, to see a firm intentionally lose money in one market (e.g., news services) in order to make money in another (e.g., advertising), or for a large player like Google or Amazon to exploit its key resource (information) across multiple markets. Of course, there have always been firms disregarding traditional industries boundaries, but this blurring of competitive and corporate strategy has become more prevalent in the digital age.

While digitalization has affected the pursuit of corporate (competitive) advantage in a number of complex ways, we focus on two here, the increasing variety of (corporate) business models and the shift from value capture to value creation, noting that digitalization has created two different types of firms. Some are technology firms, such as IBM, Oracle, SAP, and TSMC, that develop and deploy novel technologies and use (for the most part) traditional strategies that exploit their core resources and capabilities. Others are technologically-enabled firms, like Amazon, Blue Apron, Netflix, Skype, Spotify, and Zoom, which use new technologies to deliver their own products or services and have been highly innovative in how they develop new business models to create and capture value.

Variety of (corporate) business models. Digitalization has enabled innovation and experimentation, and thus enabled (new and existing) firms to develop a wide variety of new business models, which imply different logics of corporate value creation. Indeed, the term business model only found its way into the literature in the late 1990s during the original Internet revolution. Christensen (1997) once observed the biggest mistake he made when introducing his theory was referring to disruptive technologies, rather than disruptive business models. It is true that digitalization has created the opportunity for radically different approaches to delivering the same 'job to be done' by exploiting a different asset base and/or monetization method to better satisfy customer purchase criteria at lower cost (Collis, 2021).

'Business model' research has to a large extent supplanted 'competitive strategy' research in recent years as a way of talking about the fundamental choices made by firms

about where and how they compete (Massa et al., 2017). Early attempts at description (Casadesus-Masanell and Ricart, 2010) have been replaced by typologies (Baden-Fuller and Morgan, 2010; Gassmann et al., 2014) and fundamental definitions (Collis, 2021; Foss and Saebi, 2017; Prescott and Filatotchev, 2021). Importantly, business models can ‘disrupt’ a business or an incumbent at either the high end (high margin) or the low end (low margin) of the market. As such, it is a more general explanation for the success of new types of competitors than Christensen’s (1997) narrower theory of disruption. Many of the increasingly prevalent business models in the digital age include what the term ‘corporate strategy’ would traditionally capture: firms like Amazon, Google, and Uber aim to create value across a portfolio of (diversified) activities/products.

The most obvious novel (corporate) business model is the emergence of ‘platforms’ as intermediaries (Cusumano et al., 2019) in two or three-sided markets (Rochet and Tirole, 2003). While platforms already existed in the pre-digital world, such as a department store or a flea-market, reduced search and selection costs have made digitally enabled intermediation far more efficient. Platforms, in turn, support asset-lite business models of those like Uber and Airbnb that allow customers to share physical assets by creating a market for underutilized capacity. Similarly, online interactions can invalidate the need for physical locations. For example, Edward Jones, America’s largest brokerage firm in terms of offices (over 17,000) is being challenged by FinTech companies such as Robinhood that offer basic portfolio management services online with no physical locations at all. Many sectors are seeing platform business models emerge alongside traditional linear models, such as booking.com alongside Hilton or Marriott, giving customers greater choice and changing the (corporate) competitive dynamics between firms.

From value capture to value creation. It is axiomatic that corporate strategy involves creating *and* capturing value, but one notable shift brought about by digitalization is that the relative emphasis of the two activities has shifted. Both the market-based/industry structure and resource-based views of the firm traditionally focused on the ways firms could capture value, whether through building barriers to entry or through the inimitability of resource stocks. However, in today’s digital business world the most talked-about firms are often not capturing any value (even though incumbents often aim to capture additional value through digital technologies). Indeed, a paradox of corporate strategy wrought by digitalization is that enormous value creation potential exists, while at the same time little or none of that value is captured by the new industry participants. For example, while instant messaging has taken over the world – more than half the global population has a messaging application – the market leader, WhatsApp with over two billion users, has yet to earn a single penny from the business.

Digital firms have frequently adopted the ‘get big fast’ logic that the first mover can generate a self-reinforcing cycle of growth through network effects. Indeed, digitalization seems to have made growth easier than it was in the past, in part because certain types of transactions, such as collecting and analysing personal data, are more efficient than before. This has implications for *how* a firm seeks to capitalize on its potential advantages. For example, should a semiconductor design firm focus on its core competence (Prahalad and Hamel, 1990) and extract all the value created through contracts with others, or should it leverage that competence into additional activities, such as services

and solutions driven off their valuable resource? With both investors and executives/entrepreneurs in digital markets focusing on revenue ahead of profit, the consequences for corporate strategy are profound. For example, many industries have mature profit-seeking firms operating alongside growth-seeking start-ups, creating a dynamic that does not conform to traditional expectations. There are also governance and control issues, in that the capacity of a firm to take long-term and/or very bold decisions and risk tolerance varies significantly with its ownership structure, for example, between listed companies and private equity/venture capital or owner-backed companies.

This emphasis on value creation also has consequences for the distribution of profits. The phenomenon of profit migration – where one component of the ecosystem gains at the expense of another – has always existed (Jacobides and Tae, 2015), but digitalization has increased the speed of change and made the outcome less predictable. For example, neither Google nor Facebook had a clear sense of how they would capture value when they launched their search and social networking sites respectively, but once the potential for digital advertising became apparent their aggressive pursuit of advertising revenues set off a series of mostly negative consequences for the advertising industry segments adjacent to them in the value chain.

While digitalization might appear in many cases to inhibit value capture as industry structure deteriorates, it can also result in some firms building durable (corporate) competitive advantages. Digitally enabled businesses that substitute for physical assets have many characteristics of unattractive industries (Porter, 1980): they have lower entry barriers as they have no or few fixed assets; enhanced buyer power with access to more real-time information and easier (one click) switching costs; more rivalry as global reach increases; higher supplier power as disintermediation occurs by manufacturers going direct to consumers; and more substitutes as new business models disrupt the old. And yet, at the same time, digitalization has the potential to build more sustainable (corporate) competitive advantages: it creates stickiness with customers (e.g., Credit Karma just sold its customer base for USD 6 billion); it facilitates personalization that builds a trusted partnership between company and customer (e.g., Edward Jones); and it generates network effects that support winner-take-all scenarios (e.g., Facebook).

Firm Scale, Scope, and Boundaries

Issues of the scale, scope, and boundaries of the firm have been addressed from a wide variety of theoretical perspectives, such as transaction cost economics as well as resource-based and institutional perspectives. While scale means size of the firm, scope refers to the breadth of its portfolio of businesses, and how additional businesses (diversification) improve corporate performance. Applying the theories noted, digitalization can affect the scale and scope of the firm in different ways. Many of the costs of transacting and coordination may decrease, thanks to greater automation (fewer risks of human error) and greater transparency (making dispute resolution easier). These benefits are likely to be contingent on a number of factors (Afuah, 2003; Bloom et al., 2014), and some have argued that as a first-order effect we would expect digitalization to lead to a reduction in firm scale and scope, as market-based transacting becomes more efficient (Lajili and Mahoney, 2006).

However, digitalization has also increased the internal efficiency of firms, through automation of manual or repetitive tasks, AI-based systems in professional tasks (Davenport and Ronanki, 2018), and enterprise-wide resource planning systems (Ray et al., 2013). In theoretical terms, this can be seen as a reduction in internal transaction costs, which have the opposite effect of the above by enabling firms to increase in scale and scope (Luo, 2021), as exemplified by the rise of new ‘giant firms’ that dominate entire sectors, like Amazon, Google, and Tencent. There are therefore arguments to support both an expansion and a contraction of firm boundaries (Afuah, 2003; Autio et al., 2021; Brynjolfsson et al., 1994), with the outcome contingent on a range of contextual and transaction-specific factors. We consider two aspects in further detail below, first the effect of digitalization on vertical versus horizontal scope, and then its impact on the blurring of firm boundaries.

Vertical versus horizontal scope. In particular, digitalization seems to affect the choices firms make about their vertical and horizontal scope. One important long-term trend has been a shift from vertical integration towards vertical specialization. Traditionally, vertically integrated sectors, such as computing (as exemplified by IBM), automobiles (e.g., Ford), energy (e.g., BP) and pharmaceuticals (e.g., Pfizer), have seen the emergence of specialist providers at all the stages in their business systems. Many of the successful digital firms in recent years, such as Expedia, Facebook, Google, and PayPal, are characterized by narrow vertical scope as they focus on their core activity and very broad horizontal scope in terms of the products, markets, and countries they reach. Indeed, a digital platform like Amazon can sell many things to a customer with whom it has a relationship, exploiting past purchase data and the low marginal cost of adding another stock-keeping unit (SKU).

However, there are also examples that run counter to this broad trend. There are cases like the financial services firm Wise (formerly TransferWise), that become vertically integrated by disintermediating traditional distribution channels, as the cost to reach previously widely dispersed and differentiated customers is lower in the digital world. Also, Apple and Tesla are significantly more vertically-integrated than their competitors, which gives them greater control of the user experience and ensures the supply of key components.

A related empirical observation is the increasing importance of business ecosystems, ‘a group of interacting firms that depend on each other’s activities’ (Jacobides et al., 2018, p. 2256). While such ecosystems predate the digital revolution (e.g., the tiers of suppliers in the automobile industry), the network effects and switching costs associated with digital economy products have made in particular ‘platform ecosystems’ more prevalent than before. Overall, this ecosystem effect appears to lead to a reduction in firm scope, because market-based transactions are more efficient. But again, the outcome is somewhat indeterminate. For example, Amazon had about 1.3 million employees by the end of 2020, because it has chosen to own large parts of its supply and distribution activities, whereas Alibaba Group, with broadly the same business model, had only about 250,000 employees by the end of March 2021 and makes much greater use of its partners and suppliers to service its customers.

Blurring of firm boundaries. Another consequence of digitalization is a blurring of traditional ways that firms and industries were categorized (Hsu and Prescott, 2017). Indeed,

the notion of a firm 'boundary' has become harder to define in the digital age as the combination of digital technologies creates and substitutes for previously separate firms and industries (for an overview on different conceptions of organizational boundaries, see Santos and Eisenhardt, 2005). Further, if we take the legalistic definition of a firm as a 'nexus of contracts' (Jensen and Meckling, 1976) there are two possible ways in which that boundary becomes more porous. First, with respect to relations the internal labour force, instantaneous communication and remote working now support contractual forms that reduce a corporation's historical dependence on a workforce contemporaneously collocated in a single location. For example, the 'gig' economy is well documented in the USA, with, by one estimate, 36 per cent of the workforce (or about 57 million people) involved in such roles already in 2018 (Gallup, 2018).

Second, regarding external entities, the prevalence of outsourcing, offshoring, and alliances has grown enormously in recent decades. The service providers and partners are legally independent firms, and often lengthy, long-term contracts are put in place and referred to frequently in the governance of these relationships. However, at the same time, it is common for service providers' and alliance partners' employees to work in teams with their client's employees, often in the same physical location, and to use tacit coordination mechanisms that would normally be used within firms (Srikanth and Puranam, 2011). Traditionally, such third-party relationships were understood through the theoretical lenses of contract theory and transaction costs. However, alliances, joint ventures, and other arrangements that fall between a clear demarcation of market and hierarchy, challenge our understanding of the classic firm boundary. To the extent that digitalization supports such business arrangements by reducing the costs of managing them, it is likely that their incidence is increasing (Gomes-Casseres, 2015).

Increasingly, digitalization also blurs the boundary between B2C firms and their customers, with firms such as Facebook, Google, and Twitter relying on customers to create the content from which they profit. This, again, is not an entirely new phenomenon, with firms such as IKEA 'co-opting' their customers since the 1970s. Handy (1989) spoke of the 'Shamrock' organization featuring a core 'leaf' of fulltime employees, two other 'leaves' of self-employed and part-time workers, and the possibility of consumers becoming a fourth 'leaf', taking over some functions of the firm themselves. Other versions of 'self-service', such as online banking, further integrate the consumer into the firm's activities and blur the boundary between them.

Internal Structure and Design

Corporate strategy research has also given attention to the structure and design of the firm's activities, including the formal organization structure, the allocation of responsibilities and roles, how information is sourced and distributed, and how individuals are evaluated and incentivized (Collis and Montgomery, 1997; Puranam et al., 2014). Research in this domain draws from a wide variety of theoretical perspectives driven by the premise that organizational outcomes depend on the distribution of information, knowledge, and incentives across individuals for a given firm production function (Collis and Montgomery, 1997).

A well-established line of argument is firms that dominated during the industrial era used bureaucratic control systems and hierarchical authority in large part because it

was costly to share information. However, with the introduction of digital technology in the workplace, the collection and sharing of information within and between firms has become more efficient, real-time collaboration between people in different locations is now possible, and work has become more modularized which enables looser coupling between parts and greater agility in adapting to changing circumstances (Baldwin and Clark, 2000; Yoo et al., 2010). This paves the way for flatter and more fluid ways of working, so we can expect changes at the macro level on the allocation of decision rights within the organization structure, and at the micro level on individual task design and the composition of the workforce.

(De)centralized structures and decision rights. In terms of the firm's formal corporate structure, innovations in organization design, for example, the emergence of network-based structures (Baker, 1992), agile working (Rigby et al., 2018), and Holacracy (Robertson, 2015) are facilitated by firms' digital transformation (Hanelt et al., 2021), specifically by reductions in communication and coordination costs. These structures change the balance between differentiation and integration of tasks (Lawrence and Lorsch, 1967) and potentially reallocate decision rights over horizontal 'coordination' and vertical 'control' processes by enabling individuals and teams lower down in the organizational hierarchy to make better judgments about what their priorities should be and how their activities are linked to those of others across the organization (Schafheitle et al., 2020).

Adopting an information processing perspective (Garicano, 2000), digitalization reduces the cost of an individual acquiring codified information. For example, an enterprise resource planning (ERP) system in a factory can tell a shop floor worker exactly what materials are in stock and where. This enhanced access to information should lead to more decentralized and delegated decision-making. On the other hand, the lower cost of communicating vertically justifies moving decision making up the hierarchy, as senior executives with broader expertise have real time access to frontline problems and choices (Nell et al., 2021). Moreover, those at the top of the hierarchy can more effectively monitor employee performance by observing additional effort dimensions (however insidious, the location of an employee can now be observed at every moment with GPS tracking). Incentive contracts can therefore be designed to more accurately motivate and reward specific behaviours and allows for a more precise definition and monitoring of task performance. However, the net effect on the most efficient locus of decision-making remains ambiguous.

Another related effect of digitalization concerns the design and functioning of the multi-business firm's central entity, the corporate headquarters (Menz et al., 2015). Perhaps as a consequence of the blurred distinction between corporate and business-level strategy, the boundaries between corporate headquarters and the firm's operating units have themselves become more blurred. Digital technologies seem to be supporting the emergence of more disaggregated and geographically dispersed corporate headquarters, which as a result are now less well-defined entities (Kunisch et al., 2020a). The rise of modern communication technologies, for example, has facilitated the spatial dispersion of corporate headquarters (Kunisch et al., 2019), in particular contributing to the emergence of dual and virtual headquarters (Birkinshaw et al., 2017). The recent surge

in work from home due to the COVID-19 pandemic, which was enabled by digital technology, will likely contribute to further dispersion of corporate headquarter activities.

Changes in task and workforce design. The digital age has changed the nature of task and workforce design, which has implications for the firm's corporate strategy, specifically for the corporate structure, decision making, and corporate roles/functions. Distinguishing between automation and augmentation of human tasks (Raisch and Krakowski, 2021), digitalization studies originally focused on the automation of mechanical and physical actions, looking at implications of the adoption of IT hardware in operations, such as personal computers and CNC machine tools (Acemoglu et al., 2020; Brynjolfsson et al., 1994). Today, the emphasis has shifted towards the implications of investment in software and AI on the nature and distribution of work inside the firm. This research has demonstrated that IT adoption and organization design changes are complementary, with firms pursuing both and as a result simultaneously achieving superior productivity outcomes (Arnal et al., 2003).

Predictions concerning the future of different job categories in an increasingly digital world abound (Frey and Osborne, 2017; Manyika et al., 2017). The economic analysis of task-based production predicts automation increasing the demand for skilled workers with a strong substitution effect, so that low skilled workers suffer (Acemoglu et al., 2020). AI exaggerates this effect, as its adoption is complemented by employing skilled workers with decision-making capabilities and authority. As a result, skilled workers, both manual and mental, benefit at the expense of the unskilled (though see Kronblad, 2020). The organizational response to IT investment is generally to adopt human resource practices that capitalize on the technology, thereby offsetting the negative impact on the unskilled as firms cross train individuals in multiple tasks and upskill the entire workforce (Sadun et al., 2017). Hence, while a firm's digital technology will likely become even more important as a corporate-level resource, we expect that this trend will also make human capital decisive for corporate (competitive) advantage.

Changes in task and workforce design have implications for corporate management roles, such as the emergence of novel central functions that help firms to transform their organizations so that they are attuned to the demands of the digital age. For example, digitalization has contributed to the trend towards more functional specialists capable of mastering a single discipline, resulting in a shift in the composition of the C-suite (Guadalupe et al., 2014; Menz, 2012). Recent studies have examined the increasing presence of chief digital officers (CDOs) in firms (Firk et al., 2021; Kunisch et al., 2020b), suggesting the need for greater cross-functional coordination among senior teams and a greater focus on social and interpersonal skills.

STRATEGIES FOR FUTURE RESEARCH

While the impact of digital technologies on the field of corporate strategy is substantial and increasing, our understanding of these changes – in both theory and practice – is still in its infancy. Overall, there is no definitive prediction about the effect of digitalization on the external boundary or internal arrangement of the firm, nor are there any simple links between digitalization and many elements of performance. Rather theoretical

		3. THEORY DEVELOPMENT	4. KNOWLEDGE DIVERSIFICATION
		<p>Examples:</p> <ul style="list-style-type: none"> - Revisit and question assumptions of theories for the digital age - Develop new concepts of relatedness/diversification - Build new theory on institutional structures of digital firms 	<p>Examples:</p> <ul style="list-style-type: none"> - Develop theories for hybrid organizational arrangements - Identify theoretical explanations for firm scope in the gig economy - Use theories from computer science to study corporate strategy
Theories of the Firm	New		
	Existing	1. KNOWLEDGE PENETRATION	2. QUESTION DEVELOPMENT
		<p>Examples:</p> <ul style="list-style-type: none"> - Replicate studies on diversification in the digital sector - Revisit choices and trade-offs in corporate strategizing - Examine digitalization's effect on transaction costs and performance 	<p>Examples:</p> <ul style="list-style-type: none"> - Explore new classes of corporate resources in the digital age - Analyze how digitalization affects the nature of headquarters - Examine the changing roles of senior executives in the digital age
		Existing	New
Corporate Strategy Phenomena			

Figure 1. Strategies for future research on corporate strategy and the theory of the firm in the digital age

arguments and predictions can be advanced to support both sides of an issue that lead us, first, to recognize that digitalization exacerbates ambiguity and paradoxes (two offsetting effects can be occurring at the same time) and, second, to call for more research in these emerging areas.

This Special Issue of the *Journal of Management Studies* was an opportunity to showcase some of the cutting-edge research in this area, and to develop a research agenda that will encourage future work. To structure this part of the article, we propose a simple categorization scheme inspired by Ansoff (1957) that considers whether (a) the corporate strategy phenomena under investigation and (b) the theories used to explain them, are existing or new. As illustrated in Figure 1, four generic strategies for knowledge development can thus be identified, though we recognize that our categorization process is subjective and imprecise, and the boundaries between strategies are blurred. When discussing these strategies in the following, we refer to the various Special Issue articles, which are summarized in Table I.

Knowledge Penetration

The first strategy, ‘knowledge penetration’, is to explain existing corporate strategy phenomena by building on and substantiating existing theories of the firm. Research might show, for example, how digital technologies are utilized within multi-business firms to enhance synergies or to enable a shift in decision-making responsibilities between corporate headquarters and business units. Studies might also seek to replicate classic findings, such

Table I. Summary of the articles included in the special issue (in alphabetical order)

<i>Author(s)</i>	<i>Title</i>	<i>Corporate strategy domain</i>	<i>Theory</i>	<i>Method</i>	<i>Main finding</i>
Aversa, Huyghe, and Bonadio	First Impressions stick: Market Entry Strategies and Category Priming in the Digital Domain	Corporate (competitive) advantage (business models); firm scale, scope, and boundaries (market entry)	Cognitive lens (strategic categorization research)	Longitudinal, comparative case study of the market entry of Uber and BlaBlaCar in Spain between 2009 and 2018	The study finds that distinct self-categorization strategies primed stakeholders to focus (Uber) or not focus (BlaBlaCar) on similarities between the entrant and an established market category. This triggered polarized responses from media and regulators and resulted in a 'sticky' association regardless of repositioning efforts
Cepa	Understanding Interorganizational Big Data Technologies: How Technology Adoption Motivations and Technology Design Shape Collaborative Dynamics	Firm scale, scope, and boundaries (inter-organizational relationships)	Interorganizational learning	Abductive multiple case study of 13 interorganizational relationships in the Northern European industrial services and manufacturing sector	The study reveals four paths that explain how organizations' big data technology adoption motivations and different technology designs conjoin to shape collaborative dynamics. The study shows that big data technologies accelerate interorganizational learning

(Continues)

Table I. (Continued)

<i>Author(s)</i>	<i>Title</i>	<i>Corporate strategy domain</i>	<i>Theory</i>	<i>Method</i>	<i>Main finding</i>
Firk, Hanelt, Oehmichen, and Wolff	Chief Digital Officers: An Analysis of the Presence of a Centralized Digital Transformation Role	Internal structure and design (upper echelons)	Centralization perspective	Panel data regressions on a sample consisting of 7,318 firm years (913 firms) from S&P 500 and MSCI Europe companies from 2010 to 2018	The study finds that transformation urgency and coordination needs predict CDO presence. Over time, the effect of transformation urgency is weakened, and the effect of coordination needs on CDO presence is strengthened
Hänninen and Smedlund	Same Old Song with a Different Melody: The Paradox of Market Reach and Financial Performance on Digital Platforms	Corporate (competitive) advantage (performance of digital platforms)	Network externalities and transaction cost economics; platform competition and crowding; complementary assets	Quantitative analysis of a digital platform in the beauty industry from 2015 to 2017 and a survey of a subset of service providers in 2017	The study uncovers a troubling paradox for service providers participating in a platform-based online marketplace: despite increases in market reach those service providers participating in the marketplace have lower sales than others. However, service providers using more of the complementary services offered by the platform have higher sales

(Continues)

Table I. (Continued)

<i>Author(s)</i>	<i>Title</i>	<i>Corporate strategy domain</i>	<i>Theory</i>	<i>Method</i>	<i>Main finding</i>
Jean and Kim	Signaling Strategies of Exporters on Internet Business-to-Business Platforms	Corporate (competitive) advantage (internet B2B platforms)	Signaling theory; institutional theory	Quantitative analysis of survey and archival data of 205 Chinese exporters who use Alibaba.com	The study finds that the use of marketing and trade-risk-focused services positively affect export sales performance. The effect is contingent on differences in the formal and informal institutional environments between the home and host countries
Murthy and Madhok	Overcoming the Early-stage Conundrum of Digital Platform Ecosystem Emergence: A Problem-Solving Perspective	Corporate (competitive) advantage (digital platform ecosystems)	Problem-solving perspective (knowledge-based view)	fsQCA on a dataset of 52 crowdfunding campaigns to launch digital platforms posted on Kickstarter	The study identifies multiple pathways and associated propositions for successful emergence of digital platform ecosystems, notably for innovation, open-source, and information ecosystems. The framework highlights novel considerations to overcome the early-stage challenge of attracting participation to an ecosystem that is yet to emerge

(Continues)

Table I. (Continued)

<i>Author(s)</i>	<i>Title</i>	<i>Corporate strategy domain</i>	<i>Theory</i>	<i>Method</i>	<i>Main finding</i>
Nauhaus, Luger, and Raisch	Strategic Decision Making in the Digital Age: Expert Sentiment and Corporate Capital Allocation	Corporate (competitive) advantage (decision making); firm scale, scope, and boundaries (capital allocation)	Decision comprehensiveness theory; behavioral theory of the firm	Pooled OLS analysis of a sample of 669 capital allocation decisions by 85 pharmaceutical firms from 2005 to 2016 and of expert sentiment in 250,000 articles using supervised machine-learning classifiers	The study finds that a more positive expert sentiment of a business unit's productivity in the technology domain is associated with a higher capital allocation to that unit. The underlying information's determinacy affects this relationship positively, while there is only partial support for information quantity's influence
Spieth, Röth, Clauss, and Klos	Technological Frames in The Digital Age: Theory, Measurement Instrument, And Future Research Areas	Internal structure and design (corporate actors)	Technological framing (cognitive, interactive schemata); micro-foundations	Scale- development process (inductive and deductive) encompassing five steps and samples	The study offers theory and a measurement instrument that can explain and assess variety in technological frames on an individual level. The study provides support that actors' technological frames affect their reactions to organizational changes induced by the implementation of digital technologies

as of the link between diversification and performance (Hoskisson and Hitt, 1990; Palich et al., 2000), for example, in emerging digital and high-tech sectors of the economy.

Two articles in this Special Issue are examples of this penetration strategy (see Table I). Jean and Kim (2021) study 205 Chinese exporters who sell their products on Alibaba.com, building on signalling theory to identify the types of exporting strategies that are most successful. They find that the use of marketing and trade-risk focused services positively affect export sales performance, which is contingent on differences in the institutional environments between the home and host countries. Nauhaus et al. (2021) look at 669 capital allocation decisions made by 85 pharmaceutical firms, and the extent to which senior executive decisions are swayed by the sentiments of external experts. Their study reveals that a more positive expert sentiment of a business unit's product-technology domain is related to higher capital allocation to that unit.

There are many other promising lines of investigation within this research strategy. One is to revisit choices and tradeoffs in corporate strategizing. While 'difficult choices' are the essence of strategy (Porter, 1996), some traditional trade-offs may become less important in a digital world. For example, in the trade-off between commitment and flexibility (Ghemawat and Del Sol, 1998), digitalization increases the return to commitment as firms can more rapidly preempt competitors by exploiting tailored customer demand characteristics garnered through platform network effects, while the ability to pivot rapidly – using lean start-up techniques – may increase the return to flexibility.

Another interesting line of inquiry would be to better understand the effect of digitalization on transaction costs. As discussed above, there is no reason to think one type of organizational arrangement universally benefits from digitalization more than another, so careful empirical analysis is needed to understand, for example, how internal and arms-length cost reductions vary for different types of transaction. Are there certain types of communication, or production activities whose costs are reduced more within the hierarchy or across markets, and for what reasons? There are also related questions about the impact of digital technology on performance outcomes. We have discussed some broad trends in this article, as well as some exceptions to these trends, such as that Apple is more vertically integrated than its smartphone competitors. To avoid generalizing from specific cases, there is a need for systematic industry-wide studies and for sufficient time to pass before judgments are made about the relative merits of different scope choices.

Finally, the digital age offers the opportunity to study existing phenomena using existing theories but using novel methodologies. For example, Nauhaus et al. (2021) used 'supervised machine-learning classifiers' to assess expert sentiment in 250,000 articles. Future research that takes advantage of such novel methodologies allows for a more rigorous analysis, as well as the explanation of aspects of corporate strategy that were previously difficult to analyse.

Question Development

The second strategy, 'question development', involves studying novel phenomena using existing theories of the firm. The digital age has enabled a range of new corporate strategy phenomena, such as new classes of resources (i.e., data and information) that corporate strategies can build on, new strategy processes (e.g., open strategizing), and new

ways of organizing (e.g., integrated organization designs and virtual headquarters). As some of these phenomena are fundamentally different from existing ones, they provide rich ground for new contributions.

Most of the articles in this Special Issue fit within this category (see Table I). Aversa et al., (2021) compare the market entry strategies of Uber and BlaBlaCar in Spain, and they use the established concept of ‘category priming’ to explain the different outcomes experienced by the two companies. Cepa (2021) examines the use of ‘big data technologies’ in the industrial services sector and shows how existing theories of inter-organizational learning are inadequate to explain this new context. Firk et al., (2021), using established arguments from the strategic management literature, find for a sample of 913 US and European firms that transformation urgency and coordination needs are positively associated with CDO presence. Hänninen and Smedlund (2021) study the strategies of beauty salons in Finland on a new digital platform and, relying on established economic theories, highlight the tension between market reach and sales of complementary services.

Many other fruitful lines of inquiry can also be identified. One would be to examine which corporate resources are valuable in a digital world. The reduction in coordination costs discussed earlier enables fuller value extraction from available resources in a market transaction. For example, the huge rise in prices for entertainment content, as video-on-demand streaming services increase the spending on original content (Bridge, 2020), illustrates that ‘content is king’. Yet the ‘king of content’, the Walt Disney Company, has forward-integrated into streaming, to exploit scope economies and to make a direct connection with the consumer in the belief that it is the customer relationship, which is the valuable asset. Relatedly, like content, data is a valuable resource in the digital economy (Hartmann and Henkel, 2020), and thus questions about whether to sell, rent or exploit data (Capron and Mitchell, 2012), and the circumstances under which firms deliberately leave data untouched, require further attention.

Another promising area is the internal organization of multi-business firms, for example the design of corporate headquarters, corporate governance including budgeting and control mechanisms used to monitor business unit activities, and the changing roles and responsibilities of senior executives, all of which are gradually evolving (Birkinshaw, 2018). One specific example is agile methodologies that are increasingly being used in entire corporate reorganizations (Rigby et al., 2020). From a corporate-level perspective, there is a need to know more about the use of agile methodologies may affect multi-business firm (re)organizations, in particular headquarter-business unit/subsidiary relationships. While the specific emergence of a more agile workforce created by digitalization is novel, the underlying ideas around self-organizing have been around for many years, and may therefore be evaluated using existing bodies of theory (Emery and Trist, 1965; Kauffman, 1993).

Theory Development

The third strategy, ‘theory development’, seeks to explain existing phenomena by developing and testing theories that are new to the field of corporate strategy. As we have discussed, there are many areas where theory does an incomplete job of explaining current

practice in corporate strategy, and sometimes in such circumstances the best way forward is to question whether that theory is actually suitable for practice (e.g., see Ghoshal's (2005) critique of agency theory and transaction cost economics).

Developing new theory in the field of corporate strategy is, however, quite challenging, because there are so many existing theories in use, ranging from transaction cost to resource-based as well as sociological, political and behavioural perspectives, each with its own strengths and weaknesses. This helps explain why only two articles in the Special Issue utilized this research strategy (see Table I). Spieth et al., (2021) report on a careful scale-development process to shed light on the 'frames' individuals use to make sense of new technologies. Even here, the authors bring in theoretical ideas from social psychology to shape their investigation, but unlike the other articles this study represents an attempt to create theory for the field of corporate strategy in a bottom-up way.

Another example is Murthy and Madhok's (2021) study that asks how digital platform ecosystems emerge from their incipient stage, where value co-creation involves attracting complementors, to becoming platform sponsors who are unknown to one another. Drawing on the problem-solving perspective and fuzzy-set Qualitative Comparative Analysis (fsQCA) on a dataset of 52 crowdfunding campaigns, they demonstrate that a platform sponsor's choice of scope signals value co-creation opportunities and thereby attracts complementors and consumers. They then used abductive theorizing to develop novel propositions for the successful emergence of innovation, open-source, and information digital platform ecosystems.

There are plenty of other opportunities for theory development. Theories of diversification have traditionally been built on industry-based and competence-based definitions of relatedness (Hitt and Ireland, 1986; Markides and Williamson, 1994; Rumelt, 1974). But the success of digital firms like Google in moving into seemingly unrelated business areas indicates that these existing theories are incomplete, and that new ones that account for the specifics of the digital age, such as data, AI, and machine learning, are needed. There is also a need for new theories on the institutional structures that support and restrain digital firms, in particular their growth and diversification choices. For example, it is widely acknowledged that anti-trust legislation that was created and refined during the industrial age is no longer suitable as a means of restricting the dominance of Amazon that deliberately keeps its consumer prices low (Khan, 2017). There are also questions about the relevance of existing employment law, which separates people into employees and freelancers, in the gig economy, and the applicability of existing accounting standards to a business environment in which market value is driven by intangibles (Haskel and Westlake, 2017).

Knowledge Diversification

The fourth strategy, 'knowledge diversification', studies novel phenomena with novel theories. In a strictly logical sense this would seem to be a defensible research strategy, but the process of academic inquiry requires careful attention to prior work, so the path to 'knowledge diversification' almost always transpires through a combination of the preceding three strategies, and in multiple steps. As a case in point, Puranam et al., (2014) sought to understand the new forms of organizing observed in a variety

of digitally-enabled firms such as Valve Software and InnoCentive, but they concluded these new models could be best understood as different combinations of existing models (built on existing theory), rather than as wholly new. In other words, a project that started out as potentially a 'knowledge diversification' strategy turned into a 'question development' strategy.

Unsurprisingly, none of the articles in this Special Issue are strictly speaking of this type. However, we can put forward a few tentative suggestions for areas of inquiry that might ultimately reside in this category. One is the blurring of intra- and inter-organizational boundaries of multi-business firms in the digital age. The study of relationships with third parties is still largely conducted through a traditional transaction cost lens. However, many of the hybrid organizational arrangements discussed earlier, from platforms and ecosystems to gig-based employment for workers, which have implications for firm scale and scope, do not readily conform to the predictions offered by transaction cost theory, nor to its underlying assumptions. New and better theoretical lenses are needed to make sense of these increasingly common hybrid organizational arrangements.

More broadly, the increasing use of AI within firms is allowing tasks and activities that were traditionally done by humans to be taken over by computers. While AI applications are used primarily to support human activity, they are starting to replace humans in areas that involve subjective judgement, such as in selecting investments and driving vehicles. For example, 'smart contracts – scripts that reside on the blockchain that allow for the automation of multi-step processes' (Christidis and Devetsikiotis, 2016, p. 2292) are designed to specify and execute transactions with no human involvement. We know very little about the consequences of these developments for a firm's corporate strategy processes: How does AI lead to novel techniques for strategic analysis, corporate portfolio planning, and decision making? Does AI lead to more rapid corporate decision-making processes? To what extent does it centralize or decentralize decision making?

Indeed, the application of AI in this way creates challenges for theories that are built on assumptions about human behaviour, for example, the notions of bounded rationality, problemistic search, and satisficing behaviour that are central to the behavioural theory of the firm (March and Simon, 1958). While AI might seek to replicate human behaviour exactly, with its attendant limitations and frailties, it is more likely that AI 'decisions' will be governed by a different set of parameters – with these parameters shifting over time as the AI 'learns' from a growing body of data. For example, AI might not require bounded rationality due to limited human information processing capacity. In fact, excessive information is useful to make fuller use of AI in decision making. All of which suggests the need for new theory to understand corporate strategy in the digital age, inspired partly by existing theories of the firm but also by theories and concepts from computer science.

CONCLUSION

While the digital age has brought fundamental changes to business and management in general, our focus in this article was on its implications for corporate strategy. Using the theory of the firm as an interpretive lens, we focused on three broad domains of corporate

strategy: (1) corporate (competitive) advantage, (2) firm scale, scope, and boundaries, and (3) internal structure and design. We also proposed foundational strategies for future research. In particular, we suggested that there is a need to develop knowledge that accounts for the new realities of the digital age, and thus research that examines existing and new corporate strategy phenomena by building on existing theories and by developing new theories of the firm. We hope that our article – together with the eight articles in the *Journal of Management Studies* Special Issue – stimulates future research on corporate strategy and the theory of the firm in the digital age.

ACKNOWLEDGEMENTS

We are grateful to the authors and reviewers of the Special Issue entitled ‘Corporate Strategy and the Theory of the Firm in the Digital Age’ at the *Journal of Management Studies*.

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