Introduction: digital strategy – linear evolution or paradigm shift?

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Digital has become a pervasive aspect of the economy, with digital transformation occurring in an ever-increasing number of sectors, to the point that the digital-based economy will soon become the new normal (Adner et al., 2019; Cennamo et al., 2020; Dagnino & Resciniti, 2021). Concepts such as big data, artificial intelligence (AI), blockchain, platforms, or digital ecosystems, to name a few of the recent emerging trends that digital has brought along, have entered the business vocabulary, captivated the attention of scholars and practitioners alike, and are now at the center of every company's strategic thinking. It is no wonder that in recent years we have witnessed the rising excitement and the growing enthusiasm, at times even the frenzy, about these new phenomena, on the grounds of the pressing demands on managers to deal with the new reality and on academics to understand these phenomena.

Enthusiasts and advocates of the digital revolution would submit that digital transformation changes everything, from product design to how value is built and captured in the market. In some cases, particularly when a product's value is derived from connecting it with and integrating it into other products that form an integral part of ecosystems or when it is delivered through platform marketplaces (Cusumano et al., 2019a), the product's relevant market and the logic of competition themselves change drastically. So does the required strategy to effectively create and capture value in this new context (Adner & Lieberman, 2021; Cennamo, 2021). Accordingly, existing strategy frameworks developed for traditional markets are not applicable to the new digital context. Digital strategy thus involves a sufficiently substantive break with the economics and the competitive and cooperative logics (see Cennamo, 2021; Cozzolino et al., 2021) that have characterized the (traditional) economy so far, to represent a paradigm shift. Thus, it requires formulating the new (departing) assumptions, logics, and mechanisms of this new digital strategy research field. As Volberda et al. (2021) put it: "with these advances in digital technology, the very nature of strategy is changing".

Others might argue that there is "nothing new under the sun" about digital strategy. It is just "dressing up" the competitive context in which firms operate, but operating effectively in such a context and gaining competitive advantage would "not require a radically new approach to business. It requires building on the proven principles of effective strategy" (Porter, 2001, p. 64). In this sense, digital strategy represents just a *linear* evolution along the existing knowledge paradigm(s) of the strategy field.

To help shed light on how digital strategy relates to or differs from traditional strategy, we embarked on this *Handbook* project. We believe that with the rapid intensification and the inescapable consolidation of the key issues of the digital transformation of organizations, markets, and sectors, the time has come to produce a wide-ranging book about current research on digital strategy. Simultaneously, the inception of the digital age, with all its multiple remarkable fallouts, contributes to making the received body of strategy theories and tools (Andrews, 1971; Porter, 1985) progressively less adequate. It also makes it increasingly

less enlightening to interpret the expanded and fast-changing digitally grounded realities in a helpful manner. For this reason, we feel the urgent need to take stock of the advancements made in the last three to four years to develop novel and extended knowledge that is in turn capable of explaining the new digital realities by leveraging existing strategy theories and tools and cultivating new ones. As such, our endeavor turns into a wonderful opportunity to encapsulate in one comprehensive volume the state of the art of a rapidly emerging research field and ruminate on its most important current and future developments.

In this chapter, we start by explaining the reasons why the current digital age has triggered the inception of novel business settings and organizations that are extremely different from those that have previously characterized the industrial age (Birkinshaw, 2018). Second, we define what digital strategy is and explain how it matters to competition. Third, we highlight a few themes from this book's chapters that illustrate how digital strategy is different from traditional strategy. Finally, we outline the structure of this *Handbook*.

WHAT IS NEW IN THE DIGITAL AGE?

We know that we live in the digital age. Although the term is frequently used, there is little or no real consensus on its ultimate meaning. Therefore, we ask, what is the digital age? How can we define it? The digital age is a period in history that is clearly epitomized by the advent and affirmation of the electronic processing and sharing of data at a magnitude and speed that in no way we have seen before. The digital age is enabled by the emergence and adoption of four key technologies (Menz et al., 2021): computer hardware, software applications, internet and mobile communications, and AI, especially when tied to machine learning and deep learning.

The relentless adoption of these technologies, which in the last couple of years has been vastly accelerated by the global outbreak of COVID-19 and its related lockdowns in several regions of the world, has led to a massive shift in how we, as individuals, interact with one another and live our everyday life (Autio et al., 2021). In fact, the combined effects of these four key technologies have driven an unexpected dramatic compression in the cost of producing, searching, amassing, storing, analyzing, and sharing data. This condition occurs, at least for a good portion, because the use of the forceful technologies indicated above makes the fixed costs of producing, storing, and using data exponentially lower than they were in the past. Concurrently, the marginal costs of sharing data become infinitesimally low. This condition, which can be described as the one stemming from replicator dynamics or economies,[1] transcends even what Shapiro and Varian (1999) call the "economic principles of information". Shapiro and Varian suggest that, while the fixed costs of producing data may be high, the costs of using them may be much smaller. The marginal costs of sharing information may be low and declining (Menz et al., 2021). Accordingly, in the digital age, firms and organizations of all kinds face an extremely strong incentive to increase their market shares, especially by means of developing and exploiting network effects (Afuah, 2013; Boudreau et al., 2021; Katz & Shapiro, 1994) and big data effects.

One of the major effects of big data on businesses is that their dependence on the internet will increase; so will the amount of the data generated by the rapid development and evolution of technology. Big data enable firms and organizations to make smarter and faster decisions. Big data analytics also allow businesses to improve their operations and efficiency, explore other new waves of big data use opportunities, and eventually exploit new sources of com-

petitive advantage, including superior learning about the business environment and customer needs, as well as the ability to act faster on it and seize opportunities through new complementarities (Alaimo & Aaltonen; Aversa & Hueller; Ritala & Karhu; Kazemargi et al.; Thomas et al., all in this volume).

These new possibilities of developing and exploiting network effects and data-driven learning and organizing bear the potential to generate new ways of creating and capturing value, and of stretching and redefining the traditional boundaries of the (single) firm that are leaning toward more decentralized models of value creation (albeit generally tightly coordinated under the governance of a hub firm), such as digital platforms (Cennamo, 2021) and ecosystems (Adner, 2017; Jacobides et al., 2018).

Digitally born (or sometimes digitally transformed) firms usually reach an efficient scale and size that are comparatively and impressively much larger vis-à-vis industrial-age firms operating in a traditional physical infrastructure. For instance, the China-based firm Alibaba has spawned a massive shift from wholesale to consumer markets, as well as in financial services by operating its gigantic financial arm, called the Ant Group. For this reason, the traditional way of strategizing and the extant strategy tools appear today as increasingly *not* exhibiting a great fit to the new environments of the digital age as they are inexorably misaligned with the fast-changing new needs and requirements. By activating strong network effects and data-learning effects, the digitally driven, low-variable cost structures of digital firms and organizations, platforms (Cennamo, 2021), and ecosystems (Adner, 2017; Jacobides et al., 2018) become capable of driving a change in the nature of competition and, consequently, in the cooperative and competitive logics and strategies that firms employ to gain an edge over competitors. In turn, this requires dramatic changes in the received paraphernalia of strategic thinking, theories and approaches, methods, and tools (see Leiblein & Reuer, 2020). In a nutshell, we need new methods, tools, and conceptualizations to interpret properly and understand better the moving target of the digital world. This is a more polarized view vis-à-vis the pre-pandemic one of Adner et al. (2019, p. 254), who earlier deemed that while digitalization "does not require us to abandon the basic conceptualizations of the economic phenomena we are familiar with" (i.e., transaction cost, bounded rationality, and industry analysis), it is concurrently essential to acknowledge the necessity of forging "new additional tools and conceptualizations".

WHAT IS DIGITAL STRATEGY? WHY IS IT IMPORTANT?

Grappling with the concept of digital strategy while the underlying field of inquiry is in its genesis and scattered around different topics and foci is all but easy. The diversity of perspectives, levels of analysis, and objects of focus (Durand et al., 2017) is also evident in the contributions to this *Handbook*. These range from the consideration of specific digital technologies (e.g., platforms, ecosystems, business models, coopetition, AI, cloud computing, digital competition, digital convergence, open-source governance, open innovation, big data analytics) and their properties and effects to the strategic challenges and new set of tradeoffs that companies face while dealing with these technologies and digital more generally, as well as how those affect their performance.

Examining these perspectives from this angle, compared with traditional strategy (Grant, 2010; Rumelt et al., 1994), the concept of digital strategy appears multifaceted and multilevel.

It encompasses the different aspects of a firm's capacity to create as well as capture value *by means of* digital tools and/or *in* digitally enabled operating contexts (Acemoglu et al., 2020). However, and somewhat unique compared with traditional strategy, digital strategy is also about the context itself; that is, the deliberate strategic choices implemented by a (set of) firm(s) to change the structure of the economic relationships in which it is (they are) embedded in a way that serves its (their) own strategic objectives and helps it (them) shape and control the customer journey to a greater extent. Instead of taking the market and the industry as the given context defining the battlefield, with the strategy being about the choices to win in such a context, digital strategy is also, and especially so, about the strategic choices to redesign the market space and rewire the linkages along the value chain that entirely redefine the market and industry boundaries. In other words, digital strategy entails *changing the competition game* and how value is created in the first place. In this sense, digital strategy is inherently disruptive (Adner & Lieberman 2021; Cennamo et al., 2022) since it is unremittingly devoted to changing the rules of the game, whether in relation to how value is created or how it is captured within the new economic structure. Firms operating in digital markets need to continuously search for new technological, organizational, and strategic solutions to face these new intensified competitive dynamics (Dagnino et al., 2021). In fact, the burgeoning literature on platform and ecosystem strategy is all about how digital platforms and their associated ecosystems change the rules of the game and how firms can leverage them to redesign and redefine the competitive space (Cusumano et al., 2019b). In this sense, digital strategy is increasingly a "science of design", whose primary study's object is the design of new architectures of value that redefine the ways that value is created, delivered, and captured (Cennamo et al., 2022). In this regard, digital strategy is foundationally multilevel (e.g., Cennamo et al., 2020; Dąbrowska et al., 2022), involving the design of digital technologies and related processes (micro-level); the organizational boundaries and value-creation/value-capture mechanisms leveraging those technologies (macro-level); and the enlarged system of value, the value architecture, spanning multiple organizations, markets, and sectors that digital technologies empower (meso-level).

If we would, prima facie, attempt to capture this multifaceted and multilevel concept in a definition, we could define digital strategy as the design of a firm's operating model using digital technologies to transform its business model (i.e., how it creates and captures value) and/or the architecture of the value in which the firm is embedded.

The adoption of digital strategy has changed the nature of competition, thereby affecting in depth the fundamental way in which firms compete in digital markets (Cennamo, 2021; Cennamo et al., 2020). As maintained by Cennamo (2021), "with value shifting increasingly from a standalone product to platform systems, product market boundaries are no longer relevant for defining the type and intensity of competition and identifying relevant competitors. […] the competitive advantage of a firm increasingly depends on platform competition" (p. 266). Platform competition is relevant because it shifts emphasis from product competition and value capture in well-defined product markets to competition between alternative market(place)s spanning multiple product markets and ways to create greater value (consumption benefits) for the customer, often by linking one's own offering value to somebody else's product offerings.

In this way, far from leveraging traditional static competitive models rooted in the industrial organization economics-based structure-conduct-performance paradigm (Bain, 1956; Mason, 1957; Porter, 1981), the new digital competition may reward competitive dynamic moves and countermoves (Giachetti & Dagnino, 2014; 2021), first-mover advantages (Lieberman

& Montgomery, 1998), and preemptive strategies (Wind, 1997) in markets that are able to reach one or more tipping points (Gladwell, 2002). However, and despite the initial mantra and winner-take-all characterizing these dynamics, we also witness changes of leadership and the emergence of new winners along with the incumbent Big Tech initial dominators of the digital landscape (the ascent of TikTok on the social media landscape being an iconic example), suggesting a far more dynamic domain than how it has been so far characterized by new conceptual models (Cennamo et al., 2022; Hanelt et al., 2021). We still have a long way to go to capture the intricacies of these dynamics.

HOW IS DIGITAL STRATEGY DIFFERENT FROM TRADITIONAL STRATEGY?

Adner et al. (2019, p. 254) characterize the transition from traditional strategy to digital strategy as a shift from the "quantitative advances" that historically epitomized the digitally grounded advances (such as those of Moore's law and Metcalfe's law) "to a set of qualitative changes" that they essentially identify in three key processes of digital transformation (i.e., representation, connectivity, and aggregation). These "qualitative changes" are reflected well in the contributions to this volume. The chapters in this *Handbook* collectively illustrate many differences between digital strategy and traditional strategy. Rather than reiterating their main findings, we highlight a few key themes:

Digital Strategy Affects Not Only the Scale of the Firm But Also Its Scope Choices

Corporate strategy has been central to the strategy field from its inception (Andrews, 1971), dealing with diverse decisions at the corporate level on the optimal scale and scope of the business, including diversification, vertical integration, make-or-buy decisions, mergers and acquisitions, and strategic alliances. Digital challenges many of the underlying assumptions in extant research. For instance, regarding scope choices, what is related or unrelated is no longer a matter of product-level synergies, often presumed from belonging to the same or similar product markets and sectors. Complementarities at the digital technology level that support those products or related digital capabilities that can be redeployed in yet distinct markets and domains affect the scope of a firm in totally different ways. Moreover, the multiple affordances that digital technologies provide allow the organization to not only optimize its scale and operations but also expand into new areas of business and even explore new business models (Lanzolla et al., 2018). Digital offers new opportunities to expand the set of business models' archetypes; it also presents firms with new challenges to revisit, upgrade, or entirely redesign their business model(s) to remain competitive in the digital environment (D'Aveni, 2013). Contributions to this volume highlight these aspects.

In Chapter 1, Aversa and Hueller explore how digital diversification changes the traditional cost–benefit drivers in traditional diversification and how the relation between relatedness and performance shifts from a classic inverted U-shape curve in traditional diversification to an S-shaped curve in digital diversification, which increasingly favors less related diversification. They distinguish between supply-side versus demand-side and product versus business model digital diversification. They also discuss how mapping a company's digital diversification

strategy across these two key dimensions helps in understanding the overall strategic stance of the company in the competitive landscape.

In Chapter 7, Murthy and Madhok discuss how the scope choices around the digital platform helps the platform provider manage uncertainties in value co-creation by attracting the right set of complementors and fostering a predictable set of complements. They conceptualize platform scope as encompassing three elements: platform technology, sponsor, and market scope. They maintain that platform scope choices signal value co-creation opportunities, define complementors' access to shared resources for co-creation, shape the platform provider's latitude to govern the ecosystem, and define the market identity of the platform ecosystem. Therefore, compared with traditional corporate scope decisions that focus on the optimal internal system configuration, platform scope choices relate largely to the external system of value encompassing third-party firms in the attempt to design and control an interfirm organizational form that will allow the corporation to influence such a value system and thus create complementarities from which it can benefit.

In Chapter 8, Shipilov, Furr, and Burelli focus specifically on the different types of interfirm structures, proposing three archetypes of ecosystems: centralized, adaptive, and decentralized. Building on insights from the graph theory, they propose a new tool, the ecosystem canvas, to help design the ecosystem by exploring various possible configurations and business models. This tool helps managers understand how ecosystems differ from other mechanisms through which the firm manages its interdependencies with the external environment. Central to the ecosystem design is the customer journey, understood as a sequence of activities, transactions, and experiences that the ecosystem as a whole (as opposed to a sole firm's offerings) will deliver to its customers. Thus, in contrast to the traditional business model design that focuses only on a firm's core offerings, the ecosystem canvas is believed to help in developing the configuration of the activities that go beyond a firm's boundaries and involve other firms' complementary offerings and business models.

In Chapter 2, Moi, Rashkova, and Cabiddu emphasize the importance of strategic agility for organizations to innovate their digital business models across three intertwining dimensions – the business model's content, structure, and governance – to adapt to changing market conditions. This contention seems pretty well aligned with Ritala et al. (2021), who encouraged the building of digitally agile firms and organizations.

In Chapter 3, von Delft and Zhao consider the creation of new digital business models along the continuum between two polar modes: innovation (introducing new activities, and/or linking activities in novel ways, and/or creating new ways of governing activities) and imitation (borrowing certain ingredients from another business model). They define a digital business model as "the architecture of the value creation, delivery, and capture mechanisms of a firm, embodied in or enabled by digital technologies" and discuss different types of strategies to craft digital business models that fall within the innovation–imitation spectrum.

In Chapter 5, Ahn and Baden-Fuller focus on some key forces that influenced the framing of business model choices of the fourteen most important firms in the global messenger industry from 1998 to 2018. They are particularly interested in why a subset of firms, which were late entrants to the business, adopted a different business model approach that successfully challenged the leading US firms in their domestic markets. In their analysis, the authors show how cognitive motivations played a key role, challenging the idea that optimal business model templates and configurations fit into specific digital domains. The authors propose that managers and their cognitive ability can still play a major role in designing alternative value

configurations and in challenging incumbents by "changing the rules of the game" through new business models.

In Chapter 4, Lanzolla, Pesce, and Tucci take a step back in the process and focus on the different types of digitization and the interactions among the digitized units. Their conceptual development reveals how digitization of physical objects is a matter of degree and may range from full to partial digitization. This choice will likely depend on contextual factors at the firm level (the intended strategic objective) and at the level of the external environment and can rest on different logics driving value.

In Chapter 6, Boudreau, Jeppesen, and Miric consider the unique business model of "freemium" (offering both free and paid versions), which is a common approach that firms use to sell digital goods. Rather than representing mere product marketing tactics, they argue that freemium choices affect the whole organization as these involve complex product design decisions (i.e., what features are included with which products), as well as organizational design decisions (i.e., the cost structure of a business, separate versus joint management of free and pay customers, etc.). Accordingly, freemium strategies might not be viable options for all and might not lead to the expected benefits, even in the cases where freemium is a good option, *ex ante*. This might be because of what the authors call the "freemium death spiral", a pattern that may emerge when both the focal firm and its main competitors switch to freemium strategies; equilibrium can emerge where all firms observe lower revenues than what would otherwise occur.

Data: The New Core, Valuable Asset (Together with Analytics)

Firms traditionally leverage key assets they control internally (in the hierarchy) or indirectly via strategic contracting and alliances to build products and services and deliver the related value propositions to customers, as well as to capture greater value from their offerings.

In a broad sense, the term "assets" is used in strategy research to refer to both physical resources and the required knowledge and capabilities to use them (Amit & Schoemaker, 1993). Thus, a firm's human resources and technologies are conceived as core assets that it can leverage to gain competitive advantage. Competition in products is often influenced and won via competition in the underlying factor markets for those core assets (Markman et al., 2009). Strategy scholars distinguish between core and complementary assets; for instance, Teece (1986, p. 288) defines core assets as those directly relating to the core product or service, whereas complementary assets are those supporting the value delivery of the core assets in the marketplace (e.g., marketing or after-sales support). They still refer to people or technologies types of assets, related to production processes upstream (e.g., Kapoor & Furr, 2015) or distribution channels downstream (e.g., Roy & Cohen, 2017) in the firm's value chain. However, with the advent of digital, what is complementary in a traditional value chain may become the core building block in the new, redesigned value architecture market for instance, due to digital platforms leveraging the flow of data between firms and end users to structure new interactions (Alaimo et al., 2020; Cennamo et al., 2022). Data also become increasingly important to upend a firm's ability to create and deliver value to its customers and enhance its competitive positioning in the evolving competitive landscape (e.g., Krakowski et al., 2022; Zhu & Liu, 2018). A dataset thus becomes a new critical asset that firms can use as a key input resource *and* medium to build value (see, for example, Alaimo & Aaltonen, this volume). Different contributions to this volume provide information on these aspects and highlight the

key strategic levers, as well as tradeoffs, that firms face when building and managing this new class of asset.

In Chapter 13, Alaimo and Aaltonen challenge the emerging common view that perceives a larger volume of data, the so-called big data, as offering advantages to firms mainly because of their scale and scope. They argue that data are not just resources to be harvested and fed into business processes. In fact, as they advance, data do not exist as resources; businesses are the ones that turn data into strategic assets through their internal data production or as part of larger ecosystems structuring the entire data value chain. They view data as "carriers of potential meaning". Accordingly, data become valuable only when the organization meets certain technological and organizational conditions to act on the data's meaning and realize the potential value that this hints at. A dataset is both a resource that organizations use for strategizing and the medium through which they create value. This dual aspect of data has implications for how firms design their strategies to produce, use, and leverage data to create (and capture) value. For instance, the way that data are collected and produced becomes a new domain of strategic thinking and design, one that can be even more important than the focal strategy itself because data production is often tightly coupled with the kind of prediction and evaluation exercise needed to formulate and assess one's strategy validity. The authors present three characteristics of digital data production – heterogeneous, fast, and unbundled – and discuss the implications for strategizing in the context of two illustrative cases.

In Chapter 14, Thomas, Leiponen, and Koutroumpis consider the strategic challenges of building competitive advantage in the data economy and, in particular, the tension between value creation and appropriation in commercializing data products. They define data products as collections of data that are tradable. They also argue that value creation from data products depends on not only data quality but also, and more importantly, complementary data. In contrast, value capture depends on the ability to exclude others from using the data product and the complementary data. From an economic standpoint, they thus consider data as an intermediate input into a process of transformation. They discuss the data characteristics enhancing value creation and the business model implications for properly managing the tensions between creating value from data products and excluding others from appropriating such value.

In Chapter 15, Ritala and Karhu also conceptualize the value proceeding from data to the extent that "data complementarities" can be attained; that is, when data are combined and aggregated into actionable and meaningful goods, objects, and artifacts. They focus on the recombinatorial characteristic of data as the foundational element of data complementarities and consider how and at which level (e.g., internal to the firm versus interfirm) data recombination occurs and affects a firm's ability to capture value. They offer a multilevel model describing how value is captured from four types of data complementarity: internal (hierarchy), relational (bilateral contractual relationship), supermodular (platform ecosystem), and unbounded (data markets).

In Chapter 16, Kazemargi, Spagnoletti, Constantinides, and Prencipe focus on data control as a critical element of digital strategy in digital ecosystem contexts and examine how actors coordinate data control activities to co-create value. They define data control as the control over the data access, storage, and processing activities of different actors in relation to the digital strategies of each actor. Drawing on the case of the cloud-based GAIA-X ecosystem, they show that coordination starts by resolving data control bottlenecks in multilateral agreements before engaging in innovative activities that lead to value co-creation. They identify three domains of coordination to resolve data control bottlenecks: rules and policies, data

security, and service platforms. Once coordination over these domains unfolds, the actors in the ecosystem can properly engage to more effectively co-specialize their resources and capabilities, and unlock value creation and innovation opportunities from cooperation. Data control coordination thus acts as a precursor to generating complementarities among ecosystem actors, a finding that bears important implications for data strategies, especially in the context of digital ecosystems.

Digital Strategy Pushes Organizations to Focus on Resources Outside the Firms' Direct Control

Firms have always tried to influence the external environment in ways that would benefit their products and business processes. Traditionally, firms have used internal resources and assets under their own control to achieve their strategic objectives (see, for example, Jacobides et al., 2006, on how firms leverage internal assets to influence the industry architecture) or work on open innovation (e.g., Chesbrough et al., 2014; Masucci et al., 2020), showing how firms can share part of their internal assets with external firms to build complementary value and deliver more innovation. As firms now increasingly transform themselves into platform and ecosystem hubs or participate in ecosystems orchestrated by others, central to any organization's strategy design becomes the issue of how to connect to, orchestrate, and leverage resources within the ecosystem that reside outside a firm's direct control (Adner et al., 2019; Cennamo et al., 2020). Different contributions to this volume discuss distinct aspects of this strategic challenge, including the implications for how firms design competitive and cooperative strategies, how they create value in platform business models, and how they govern firm relationships with an ever-expanding set of loosely connected yet interdependent firms.

In Chapter 9, Gerwe and Silva discuss the peer-to-peer platform business as a new business model and strategic approach to source, direct, and control value co-created by platform end users. They categorize peer-to-peer platforms along three salient dimensions: the type of asset underlying the transaction, the mode of transaction, and whether monetary compensation to the peer-provider exists or not. They also discuss the key strategic choices for leveraging this business model, mainly in relation to attracting, matching to, and retaining users in the platform.

In Chapter 10, Reinsberg, Solem, and Pedersen discuss the different strategic logics for value creation of digital platform businesses, with a specific focus on transaction platforms; that is, those facilitating transactional exchanges between or among two or more groups of customers.

They present four fundamental value logics and explain how these are specific to platform business models compared with traditional pipeline business models. The common feature of all types of value logics is that the platform value increases with the size, scope, or quality of the resources residing outside the platform firm's direct control, but the digital platform somehow helps in coordination by structuring interactions with the (end and business) users controlling those resources.

In Chapter 11, Constantiou discusses the role of user-engagement strategies in social media platforms for value creation. A platform's user base is by now considered a critical external resource for creating and capturing value in digital, platform-mediated markets. However, Constantiou argues that effective platform management strategies must go beyond attracting new users and ensure that current users remain active and engaged with the platform in the

long term. She conceptualizes user engagement as one's emotional, cognitive, and behavioral investment in a brand or a technology. In the specific case of social media platforms, user engagement manifests in users interacting and sharing content readily and voluntarily with others, as well as cognitively and emotionally bonding with the platform. Accordingly, user engagement goes beyond marketing tactics and involves the design of the core platform technology, for instance, regarding which technology features to introduce and how to structure and govern interactions among users. User-engagement strategies also have implications for how firms decide to compete. User engagement can be leveraged, for instance, to create hidden switching costs – that is, to increase user retention and lock the user into the platform services – or to build platform differentiation and escape winner-take-all dynamics with rival social media platforms.

In Chapter 12, Huber, Kude, Lepoutre, and Malaurent consider the broader spectrum of user interactions with the platform, as well as the range of social actions that business users, as a collective, might engage in to challenge some of the governance practices imposed by the platform owner and create a counterweight to the latter's relational power by joining forces and forming a movement. They distinguish among six types of collective actions and study how they become connected and evolve over time. Focusing on Apple's iOS ecosystem, they illustrate how a movement of third-party developers, who were initially disconnected and isolated, emerged and organized between the summer of 2016 and the summer of 2021, forcing Apple into changing some of its App Store rules. It also managed to influence regulatory initiatives in the European Union and the US.

In Chapter 17, Filatotchev and Lanzolla focus on the internal corporate governance system (i.e., the system governing a firm's internal relationships) to assess its validity in the era of digital transformation. While corporate governance has traditionally been based on a *closed-system* framework focused on aligning the interests of managers (agents) and shareholders (principals), the authors consider an *open-system* approach to governance as more effective in dealing with increased interdependencies among external stakeholders, firms, and resources ensuing from digital technology diffusion and use. They advance the concept of open-source governance to signal the shift to more shared, participatory governance of the corporation that relies more on strategic rather than financial controls in the firm's governance mechanism. They maintain that strategic controls deploy more informal systems of communication between managers and stakeholders and allow risk-management systems to include broader risks of de-legitimization. In this type of governance, reputational and trust considerations, rather than the market for corporate control, underpin external governance pressures on managers. Overall, open-source governance shifts the emphasis from the internally narrow focus of the agency perspective to the development of a system of interactions between the firm and its ecosystem.

In Chapter 18, Shtepa, Bao, and Osiyevskyy assess the microfoundational impact of information technologies, such as AI algorithms (e.g., machine learning) and big data, on the managerial decision-making process, thereby stressing their capability to enable automated and augmented rationality. Actually, according to the authors, AI systems lessen the managerial bounded rationality problem by moving from the satisfying mode to the optimizing mode in managerial decision making. Subsequently, they analyze the effect of AI in four specific domains of decision making: determination, design, deliberation, and discovery. The authors advance a microfoundational framework to examine the strategic impact of AI on organizational business models and the sources of competitive advantage.

In Chapter 19, Dagnino and La Bruna examine the strategic use of big data analytics by firms to grasp their applications in business practice and relevant effects on performance. They first illustrate the four main types of advanced analytics (AAs; i.e., descriptive analytics, predictive analytics, prescriptive analytics, and automated analytics) and the key factors driving the performance effects of AAs: Some sectors benefit more than others from using AAs. The information intensity of each sector influences AA effects on firm performance. Large firms are usually those that have more direct access to AA advantages vis-à-vis small and medium-sized enterprises (SMEs). They feature the main characteristics of the application of AAs in four relevant economic sectors (finance and insurance, manufacturing, healthcare, and logistics and supply chain) and discuss the strategic advantages and disadvantages stemming from the firms' adoption of AAs.

In Chapter 20, Reischauer and Hoffmann consider some of the implications of increased dependence on external resources for how firms design their cooperative and competitive strategies, particularly for how they handle coopetition – the simultaneous engagement in cooperation and competition with firms, ecosystems, or platforms. They introduce the concept of digital coopetition, which they define as the simultaneous and technologically embedded competition and cooperation among firms to create and capture value for one another. Digital coopetition thus differs from traditional coopetition in that firms' value creation and value capture are fundamentally embedded in digital technologies. This brings forth new opportunities for collaboration, but at the same time it also creates strong incentives for opportunistic efforts to leverage control over data, customer relationships, or both in order to gain advantage over the coopetitor. They lay out the firm-level conditions that give rise to digital coopetition and discuss the key aspects departing from traditional coopetition. For instance, in the digital context, coopetition occurs through standardized modes as opposed to bilateral contracting. This has implications in terms of the nature of the interplay, as well as the tensions, and how to manage them, which the authors discuss at the end of the chapter.

In Chapter 21, Ferrigno and Di Minin review previous studies on open innovation to shed light on its three constructs that, in their view, firms need to take into account when they design, develop, and implement digital strategies. These three items are purposeful knowledge exchange, business model alignment, and the strategic management of intellectual property. Using a qualitative design analysis, they explore the three constructs directly in several firms that opened up their innovation processes by developing digital technologies: King of App, GoOpti, and Cynny. From the analysis of the three cases, Ferrigno and Di Minin extract five managerial implications that need to be adopted for an effective open-innovation approach and digital strategy design.

Finally, in Chapter 22, Li tackles the notion of digital strategy and digital technology adoption to propose a framework in order to understand the reasons why every company is currently in need of having its own digital strategy. Li also detects the key implications for incumbents and digital-native firms competing in the digital age. Li's proposed framework is rooted in two key alterations in the environment: the changing nature of the economy and the rapid development of digital technologies. These changes in combination are able to redefine the rules of the game, forcing companies to reevaluate and regenerate their strategies and business models by exploiting their digital capabilities. According to Li, business leaders' main challenge does not lie in generating new ideas but in effectively managing the crucial transition to the adoption of new technologies, strategies, business models, and organizational designs as well.

WHAT IS NEXT IN DIGITAL STRATEGY?

What is next in digital strategy? This is essentially a question we pose for future research. Unfortunately, we do not have access to the fortune teller's legendary crystal ball; hence, we can hardly predict how the field will evolve. But, on the ground of the current trends, we may share few guesses. The next stride we envisage for developing digital strategy is to have it engaged in the rising "sustainability challenge". This means that digital strategy may be called on to develop corporate sustainability, sustainable business models and sustainable development (Ritala et al., 2021). For instance, the application of digital technologies may serve to deal with grand challenges such as climate change (George et al., 2021) and digital platforms might support the nurturing of circular economy business models through an efficient use of resources (Ciulli et al., 2020).

Another stride we envisage is for management scholars to engage increasingly with the "competition and social policy challenges" that digital technology involves. For all the enthusiasm of current strategy scholarly research to document the value-creation capacity (and related strategies) of digital technologies and their associated new organizational structures such as platforms, ecosystems, and decentralized governance, the field has largely eschewed from dealing with the sort of puzzling questions that antitrust busters, policy makers, and society at large are posing in relation to the potential distortions on competition and even society's democratic dynamics that excessive monopolistic power of Big Tech can produce. For instance, there is emerging research highlighting possible "market failures" taking place in ecosystems in idiosyncratic forms, including "cooperation failures" – lowered incentives to invest in quality and cooperate due to value-capture problems (e.g., Miller & Toh, 2022; Panico & Cennamo, 2022); "access failures" – exploitation of data aggregation and control to dictate excessive terms of participation (Kramer et al., 2019; Parker et al. 2021); and "self-preferencing" – promotion of a platform's own services at the expense of those equally (or more) valuable of complementors (Sokol & Zhu, 2021; Zhu & Liu, 2018).

Some of the fundamental questions in business, such as how value jointly produced is split among firms, what is a fair distribution of economic value among firms, and when does competition turn into an unfair game, take on new shape and relevance in the digital economy context. To fully develop the new digital strategy paradigm, strategy scholars would need to address these questions, else the risk for the field might be of developing theories and frameworks that are foundationally vitiated in terms of their exploitative nature, and hence be of little relevance if not harmful in their practical application.

STRUCTURE OF THIS *HANDBOOK*

This volume is structured as follows. In Part I, the *what* question of digital strategy is explored, considering digital strategy as fundamentally about the design choice of an effective digital business model. The chapters focus on the different aspects of digitization (e.g., Chapter 4), what parts of the business model change as a result of digitization and what are the enabling factors (Chapters 2, 3, and 5), and which new strategies at the corporate level (e.g., digital diversification – Chapter 1) or the product level (e.g., freemium strategies – Chapter 6) are implemented and how they differ compared with the analog reality.

Parts II and III deal with the *how* question of digital strategy. Part II focuses on the design of the digital organizational architectures and their inner logics of functioning, with the chapters emphasizing decisions about digital platform boundaries (Chapter 7), the design of ecosystems (Chapter 8), the value logics of these new organizing modes (Chapters 9, 10, and 11), as well as new tensions and governance forms (Chapter 12).

Part III focuses more specifically on how value is created and captured through data strategies. It explores how digital data empower the strategy-making and implementation process to unlock new value-creation opportunities (Chapter 13), how firms capture value from data (Chapters 14 and 15), and how data can be used as means of structuring and coordinating interfirm relationships (Chapter 16).

Finally, Part IV tackles the *why* question of digital strategy, pointing to the challenges that managers face when dealing with digital, which challenge the same essence of the firm and recast the question of its role in the business environment. Chapter 17 focuses on the challenges of the extant corporate governance system and offers an alternative open-source model to cope with the new demands of the digital era. Other chapters inspect the impact on management practices of specific digital technologies and processes (Chapters 18, 19, 20, and 21).The concluding chapter (22) poses some foundational and provocative questions about the impacts of digital strategy that managers should ask before embarking on crafting specific strategies.

NOTE

1. In the digital age, many items (i.e., products or services) are free of charge in the sense that their cost is so low or proximate to zero as to come unnoticed. This trend is possibly destined to continue in a way that will cover more products. As such, it is concurrently likely to have profound consequences for the nature of work and society.

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