

Executive summary

The next big arenas of competition

Arenas are industries that transform the business landscape. Eighteen future arenas could reshape the global economy and generate \$29 trillion to \$48 trillion in revenues by 2040.

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At a glance

- **Arenas are a unique category of industries defined by two characteristics: high growth and dynamism.** They capture an outsize share of the economy's growth, and the market shares of players within them change to an outsize degree.
- **We have identified 18 potential arenas of the future that could reshape the global economy, generating \$29 trillion to \$48 trillion in revenues by 2040.** These arenas range from AI software and services to cybersecurity, from future air mobility to drugs for obesity and related conditions, and from robotics to nonmedical biotechnology. These future arenas could generate \$2 trillion to \$6 trillion in profit by 2040. Their collective share of global GDP could increase from 4 percent to 10 to 16 percent by 2040.
- **Twelve arenas of today showed outsize growth and dynamism from 2005 to 2020.** These industries include e-commerce, biopharma, electric vehicles, consumer internet, and cloud services. They had a revenue compound annual growth rate (CAGR) of 10 percent and market capitalization CAGR of 16 percent, and they tripled their global GDP share from 3 to 9 percent in the period. By contrast, non-arenas had only a 4 percent revenue CAGR and a 6 percent market cap CAGR over the same period.
- **The many striking differences between the 12 arenas of today and non-arenas inform our understanding of the arenas of the future.** Arenas earn far greater profits than other industries do, they spawn a disproportionate number of global giants, and they offer unusually strong opportunities for new entrants to become powerhouses.
- **Three combined ingredients in an “arena-creation potion” tend to generate the escalatory mode of competition that characterizes arenas.** The telltale elements of a forming arena are business model or technological step changes, escalatory investments, and a large and/or growing addressable market. The presence of these elements can lead to escalatory competition among players, who make large investments to gain not only market share but also a product quality edge, compounding the benefits and further setting them apart from other companies in a race to the top.



Introduction

This report from the McKinsey Global Institute identifies and describes a category of industries that could account for much of the future change in the business landscape and transform the world. We call these industries *arenas of competition*. To identify the arenas of tomorrow, we look back at the arenas of today to see how they evolved. Arenas are defined by two characteristics: they capture an outsize share of the economy's growth, and market share within them changes hands to an outsize degree. The presence of those two attributes indicates that a new competitive game has begun, usually prompted by a new bundle of technologies and business models.

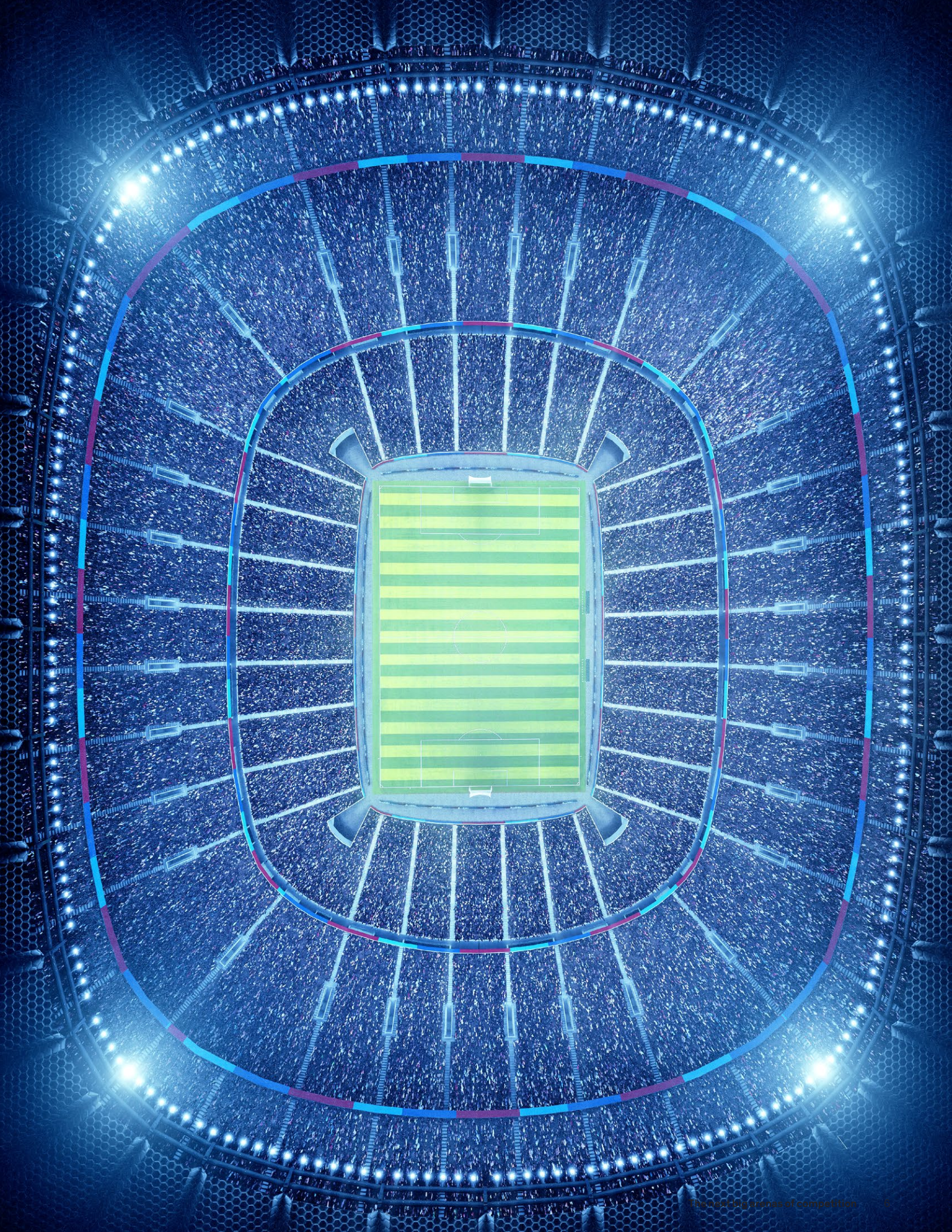
Understanding arenas is important for at least two reasons. First, they are where the business world is reshaped. They account for many major shifts in investment, R&D, and value, as well as the emergence of many new and growing global corporations. Second, once we start to recognize the factors that could point to the potential formation of an arena, we can identify a set of arenas that could plausibly emerge over the next 15 years. If the past is any guide, they will be centers of competition, innovation, and value creation.

The report begins with a discussion of 12 arenas of competition that emerged between 2005 and 2020, including cloud services, e-commerce, biopharmaceuticals, and electric vehicles (EVs). Chapter 1 identifies the arenas of today by drawing on a large, customized data set of the top 3,000 companies by market cap and explores how the arenas differ from other industries. We used 2005 to 2020 as our analytical interval to delineate a clean decade boundary and ensure consistent, well-established data. Some of the differences are striking: in 2005, these arenas generated only 9 percent of our sample's economic profit, but by 2019 they accounted for 49 percent of all economic profit in the biggest companies.

In chapter 2, we examine how today's arenas emerged and grew as companies entered a mode of intense competition and made the escalatory investments characteristic of arenas. Understanding this industrial logic is crucial because knowing how today's arenas were born could help us spot tomorrow's potential arenas. We identified a "potion" that appears to underlie the emergence of arenas.

In chapter 3, we describe 18 potential arenas of tomorrow and explore how they may materialize, including their potential sources of growth and dynamism. Understanding potential arenas is relevant for entrepreneurs and incumbent companies that want to compete directly in arenas, other companies whose businesses would be affected by the emergence of arenas, investors looking to allocate capital to these industries, people seeking jobs in the winning industries of the coming decades, and policy makers looking to play a role in how and where these industries develop.

A compendium covering the 18 industries that could become the arenas of tomorrow includes further descriptions of the growth factors and competitive dynamics that we present in the report and that could shape each potential arena over the coming decades. To be sure, looking into the future is always speculative, and we recognize the possibility—indeed, the likelihood—that we may be getting some things wrong. For that reason, we have made transparent our assumptions, or what you need to believe about each candidate arena to match our scenarios. This will allow readers to calibrate their own views of which industries will end up becoming arenas.



Executive summary

This report identifies a set of present and future *arenas of competition*, industries that could transform the business landscape and our world. Arenas are defined by high growth and high dynamism. These industries capture an outsize share of value growth, and market share within them shifts dramatically, as measured by the “shuffle rate,” a metric of company market share movements (Exhibit E1). These two characteristics signal a new era of competition and signify new technologies and business models in play.

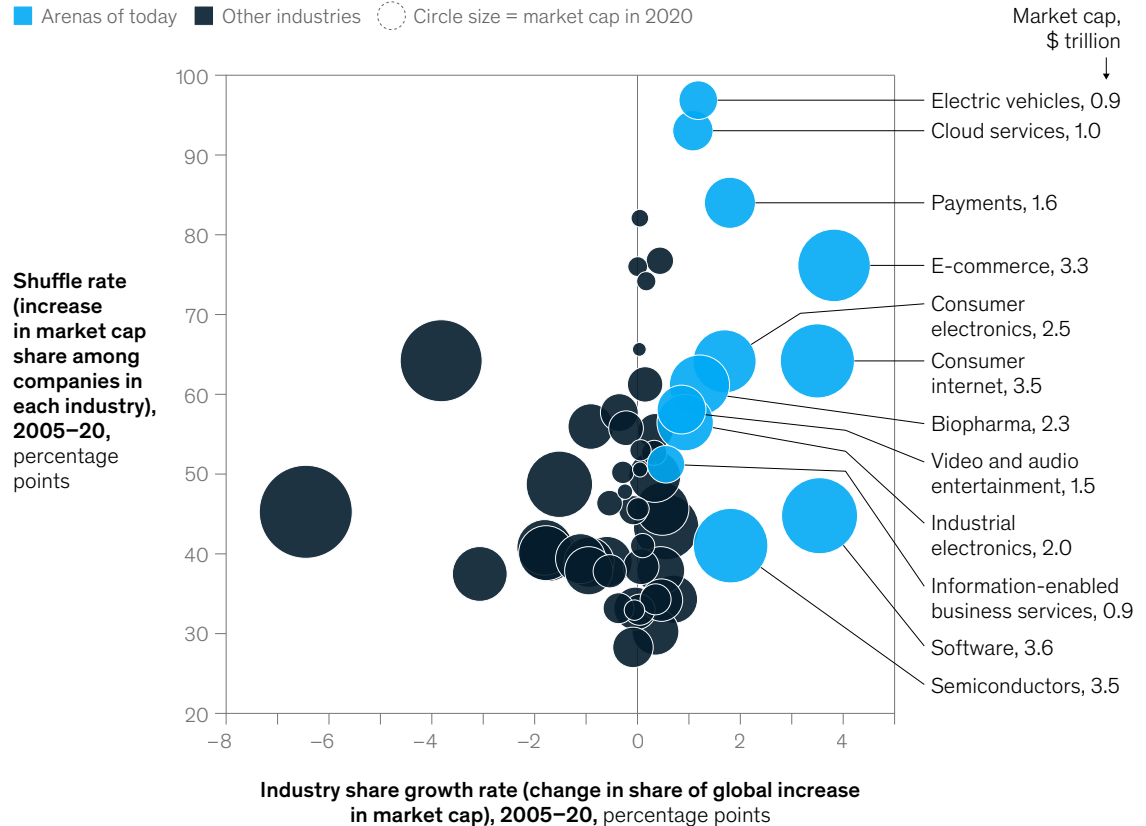
The arenas of today

We have identified 12 arenas of today: software, semiconductors, consumer internet, e-commerce, consumer electronics, biopharmaceuticals, industrial electronics, payments, video and audio entertainment, cloud services, electric vehicles (EVs), and information-enabled business services (ranked in order of 2020 market cap). “Arenas of today” refers to the arenas that formed over the past two decades. We used 2005 to 2020 as our analytical interval to set a clean decade boundary and ensure consistent, well-established data. Understanding arenas is important for at least two reasons. Not only are they where the business world is reshaped, but recognizing the elements that are usually present in an arena and that help explain its growth and dynamism allows us to identify a set of arenas that could plausibly emerge over the next 15 years. If the past is any guide, they will be centers of competition, innovation, and value creation.

In 2005, arenas generated less than 10 percent of total global economic profit. By 2019, they accounted for half of the total.

The 12 arenas of today exhibited outsize shuffle rates and significant growth in share by market cap.

Market cap shuffle rates and growth share for 57 industries



Note: Based on McKinsey Industry Classification; Quality 4 & 5 data from McKinsey Value Intelligence, PitchBook only; subsidiaries excluded; includes only firms with market cap >\$3.5B in 2005 or >\$5B in 2020; number of firms by arena varies; firms identified as did not exist/nonpublic in '05 based on no McKinsey Value Intelligence market cap data in 2005.
Source: McKinsey Value Intelligence; McKinsey Global Institute analysis

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Today's arenas stand out from other industries in six ways.

- **Arenas captured an increasing share of economic profit.** In 2005, arenas generated \$55 billion, or 9 percent of total global economic profit, while other industries generated \$549 billion, about 90 percent of the total. By 2019, arenas were generating \$250 billion—half of total global economic profit. Comparing 2005 economic profit rankings with those from 2019 and 2020, every arena except industrial electronics moved up.
- **Arenas attracted outsize levels of investment for innovation.** Arenas' share of R&D investment was already high in 2005 and remained high for 15 years. Sixty-two percent of US business R&D spend went to arenas and arena-adjacent industries in 2005; that figure increased to 65 percent by 2020. Semiconductors and electrical components accounted for the largest share, followed by biopharmaceuticals and software.

- ***Arenas enabled new entrants to grow.*** In 2020, 33 percent of arenas' total market capitalization was held by companies that had been "outsiders" in 2005—that did not exist, had market caps of less than \$3.5 billion, or existed but were not yet meaningful competitors in those arenas. In comparison, businesses new to non-arena industries held just 15 percent of total market cap. New players tended to enter during early stages of arena formation when competitors identified innovations that met customer demands as targets for investment. This competition led to arenas' characteristic dynamism.
- ***Arenas spawned giants.*** Arenas were more likely than non-arenas to give rise to the world's largest companies. In 2020, 74 percent of arenas' total market cap was held by companies with market caps greater than \$50 billion, compared with 47 percent for other industries. Fifty percent of arenas' total market cap was held by companies with market caps greater than \$200 billion, compared with only 15 percent for other industries.

Large companies were also more likely to be in arenas. Of the companies with market caps above \$200 billion, more than half belonged to arenas, even though arenas represent only one-fifth of the overall sample by number of companies. In 2005, just one of the top ten companies was in a future arena—Microsoft, with a market cap of \$278 billion. By 2020, eight of the ten were in arenas, with market caps ranging from \$511 billion to \$1.7 trillion.

- ***Arenas tended to be more concentrated.*** Concentration was observed at certain times in arenas; for example, the top ten players in five arenas (cloud services, consumer electronics, consumer internet, EVs, and payments) accounted for at least 90 percent of 2020 arena market cap and revenues in our sample. At the same time, competitive pressure to innovate remained. Investments that improve products or take advantage of network effects can have increasing returns, requiring leaders to continually innovate to retain prominence. Arenas' industry structures are rarely static or stable in the long term. Escalatory investments and their exceptional returns for arenas can inspire fierce competition in markets that already have high levels of innovation, provoking step changes in technology and business, which can disrupt the ranks of winners.
- ***Arenas were more global.*** On average, 50 percent of arena revenues were generated outside companies' home regions, compared with 42 percent for non-arena companies. Companies in arenas were also much more likely to be multinationals. Sixty-eight percent of arena companies derived more than 20 percent of their revenues from countries other than their own. By contrast, about half of non-arena companies took in more than 20 percent of revenues from other countries. The software arena is particularly global. Its four largest companies by 2020 revenues—Microsoft, IBM, Oracle, and SAP—generated almost 60 percent of their revenues outside their home countries.

The origins of arenas

To help us identify future potential arenas, we examined how today's arenas originated. We observed three elements that, when combined, were likely to result in high growth and high dynamism and to generate an arena. The three ingredients, which we call an "arena-creation potion," are business model or technology step changes, escalation incentives for investments, and a large or growing addressable market.

- ***Business model or technology step changes.*** Technology performance and adoption are often modeled as idealized S-curves. When a technology capability undergoes a step change, adoption starts off slowly, reaches an inflection point when it accelerates, then flattens out as the technology reaches maturity. Although real-world technology capabilities and adoption do not perfectly adhere to this S-curve, we observe technology step changes in our arenas, for example the innovations in lithium-ion battery technology that enabled production of EVs at scale. Business model step changes can also result from technology that shifts commercial models (who pays for what and how) for products or services, thereby disrupting existing market structures, as occurred with e-commerce and with video and audio entertainment (streaming).
- ***Escalatory incentives for investments.*** Companies that leverage investments to not only produce more products but fundamentally change and improve their products can boost their competitive position and rapidly gain market share. Such investments are features of specific types of spending, such as marketing, R&D, and certain capital expenditures. As companies advance their capabilities in this way, they tend to also improve long-term margins and see returns increase with scale. As a result, competitors also have a strong incentive to invest, beginning an "arms race" in which they iteratively invest to scale and scale to invest, causing a simultaneous escalation in capabilities. This pattern accelerates growth and the kind of market share jumps that are typical of arenas, and eventually can limit the ability for new entrants to enter the arena, unless a new technology or business model step change again opens up the playing field.
- ***Large or growing addressable market.*** Companies tend to reach large or fast-growing markets either by already playing in sizable markets where demand growth continues to outstrip the rest of the economy or by displacing share of an existing large market with a superior product or service. The companies in our arenas that played in fast-growing markets took advantage of technology and business model step changes to accelerate value creation. These markets typically already had revenue pools of more than \$100 billion in 2005, and companies competing in them made escalatory investments that improved efficiencies or broadened capabilities. These arenas included biopharmaceuticals, industrial electronics, information-enabled business services, consumer electronics, payments, semiconductors, software, and video and audio entertainment. Together, they recorded 5 to 13 percent revenue compound annual growth rates (CAGRs) from 2005 to 2020. Companies that displaced share of existing large markets achieved rapid growth by launching novel categories of products or services, taking shares from existing markets or unlocking latent demand. These companies' industries include cloud services, consumer internet, e-commerce, and EVs. Their revenue grew at a 13 to 33 percent CAGR from 2005 to 2020.

The three ingredients of the arena-creation potion produce an escalatory mode of competition, which results in high growth and high dynamism. The continuous investments characteristic of escalatory competition typically build heightened competitive capabilities and globally relevant scale. Competition in these settings can be like a tournament with a huge prize to the winner, but it is not a lifelong crown, because a new round of competitive escalation often begins just as the last one is settling. This dynamic contrasts with more traditional modes of competition, which involve initial entry costs and additional investments to increase production quantity that result in more localized and

static industry structures. In escalatory competition, players must iteratively improve product quality through investment and capability building to obtain or retain market share.

In addition, the arenas of today generally benefited from the overall trend toward digitization. This last era of digitization was a fertile place for big arenas to bloom. Global internet connectivity allowed e-commerce players to connect buyers and sellers across the globe, providing the opportunity for customers to purchase goods anytime, anywhere. Digitization also transformed video and audio entertainment—and streaming video in particular—by shifting media consumption from movie theaters and CDs to homes and mobile devices.

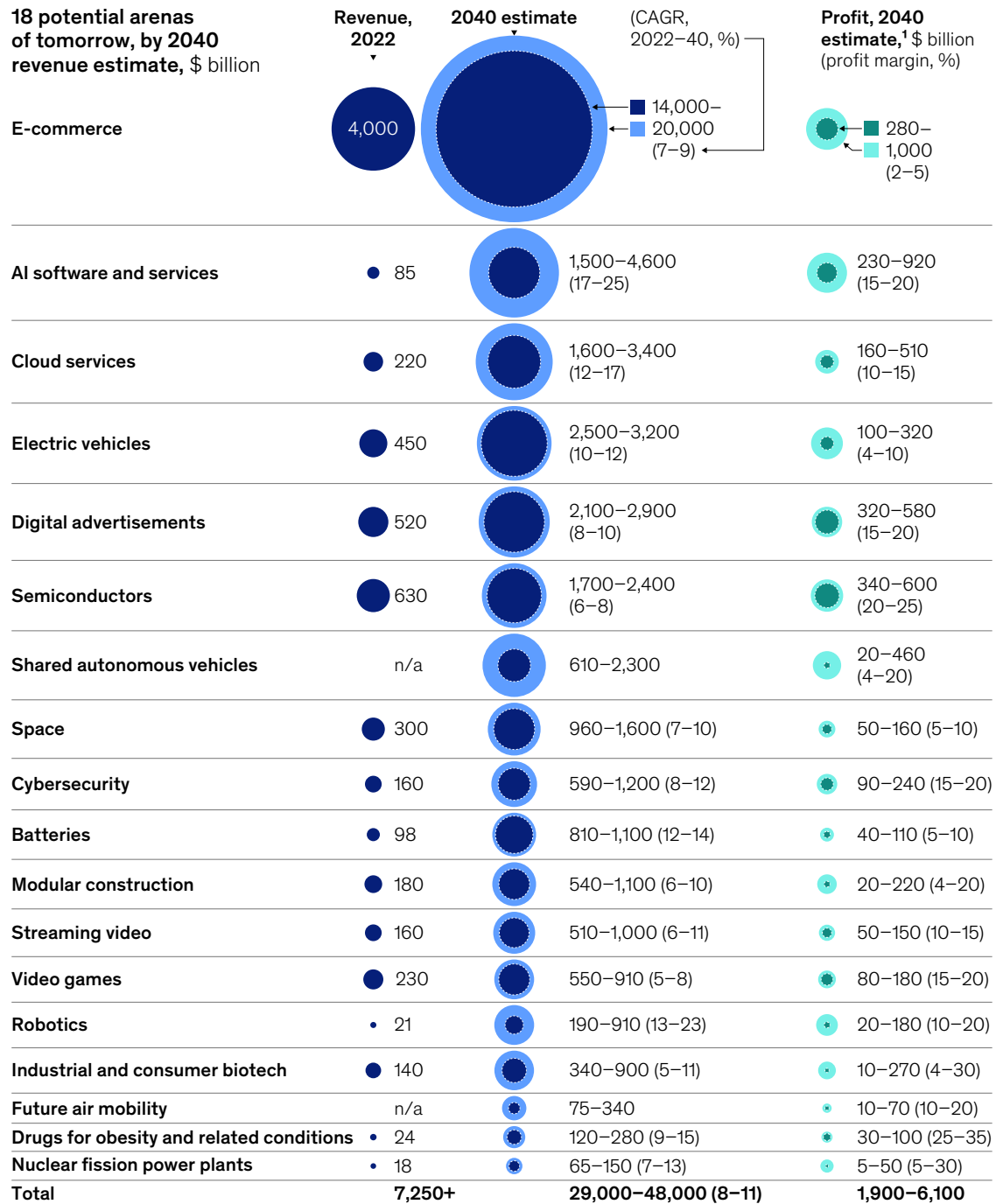
Continual exponential improvements in the cost of processing and communicating information created a long S-curve. Digitization enabled global markets and scaled distribution platforms. Software-driven business models with low variable costs and strong network effects created a powerful battleground for escalatory investment. It is no surprise that most of today's arenas are rooted firmly in the digital economy.

The arenas of tomorrow

With these insights on existing arenas and their characteristics as a guide, we have identified 18 potential future arenas that together could yield \$29 trillion to \$48 trillion in revenues and \$2 trillion to \$6 trillion in profits by 2040 (Exhibit E2). In terms of impact on the economy, we estimate that they could grow from about 4 percent of GDP in 2022 to 10 to 16 percent by 2040. This translates to a 18 to 34 percent share of total GDP growth. This shift in GDP share is a hallmark of arenas: if we perform a similar analysis on our arenas of today, we find that the sample companies increased their equivalent share of GDP from 3 percent in 2005 to 9 percent in 2020.

**Some arenas of today will
continue as arenas of tomorrow.
Others will no longer qualify
for arena status.**

The 18 potential arenas of tomorrow could generate \$29 trillion to \$48 trillion in revenues and \$2 trillion to \$6 trillion in profits.



¹Defined as net operating profit less adjusted taxes (NOPLAT). NOPLAT share based on most closely mappable industries from our database of 3,000 companies analyzed in chapters 1 and 2.

Source: Company annual reports; McKinsey Value Intelligence; McKinsey Global Institute analysis

The potential future arenas can be divided into three groups: arenas of today that are likely to continue developing into arenas of tomorrow; subsegments of current arenas that may grow sufficiently large and fast to become spin-off arenas; and emergent arenas that are not as closely linked as the potential spin-offs to any of today's arenas. While at different stages of their evolution, each displays early signs of the three arena-creation elements.

Continuing arenas

1. ***E-commerce***. Companies that sell goods through digital channels and fulfill them directly
2. ***Electric vehicles***. Manufacturers of battery, plug-in hybrid, and fuel-cell EVs
3. ***Cloud services***. Companies that deliver on-demand cloud infrastructure and platforms as a service
4. ***Semiconductors***. Designers and manufacturers of semiconductors, microchips, and integrated circuits as well as providers of tools for semiconductor manufacturing

Spin-off arenas

5. ***AI software and services (spin-off from software)***. Companies that provide software and services incorporating AI, excluding the hardware necessary to operate AI
6. ***Digital ads (spin-off from consumer internet)***. Platforms that enable advertisers to reach consumers digitally
7. ***Streaming (spin-off from video and audio entertainment)***. Providers of on-demand video entertainment over the internet

Emergent arenas

8. ***Shared autonomous vehicles***. Operators of shared autonomous vehicle services
9. ***Space***. Providers of space-related infrastructure and services to the commercial and state-sponsored segments
10. ***Cybersecurity***. Companies that provide protection for computer systems from unintended and unauthorized access, modification, or destruction
11. ***Batteries***. Manufacturers of rechargeable batteries used for EVs and other technologies that are mostly linked to the energy transition
12. ***Video games***. Producers and distributors of games played on dedicated consoles, PCs, and mobile phones
13. ***Robotics***. Manufacturers of robots and providers of robotics solutions
14. ***Industrial and consumer biotechnology***. Providers of biotechnology-enabled products in markets like agriculture, alternative proteins, biomaterials and biochemicals, and consumer products
15. ***Modular construction***. Companies that operate in the modular construction value chain, from design to assembly, with volumetric modules
16. ***Nuclear fission power plants***. Players that construct nuclear fission power-generation facilities
17. ***Future air mobility***. Operators of air mobility transportation services, such as electric vertical takeoff and landing vehicles (eVTOLs) and delivery drones
18. ***Drugs for obesity and related conditions***. Companies that sell glucagon-like peptide-1 (GLP-1) drugs and other treatments for obesity and related conditions, such as diabetes

Five arenas of today—biopharmaceuticals, consumer electronics, information-enabled business services, industrial electronics, and payments—could lose arena status. They are unlikely to maintain the scale of growth and dynamism that would propel them into being arenas of tomorrow.

We also examine almost-emergent arenas, industries with some elements that could make them arenas but that also have uncertain growth or dynamism prospects and a relatively lower probability of evolving into arenas. We include these because predicting the development of arenas is not an exact science, and we recognize that we could be wrong. These potential arenas could represent significant opportunities. The almost-emergent arenas include clean hydrogen, lower-carbon materials, products and services for older adults, nuclear fusion, renewables generation equipment and infrastructure, sustainable fuels, virtual reality and augmented reality, and Web3 (including decentralized finance).

Our analyses of present and future arenas reveal three key swing factors that go beyond uncertainties in the modeling and could be fundamental to the evolution of the arenas of tomorrow in technology, investment patterns, and sources of demand. These factors are developments in geopolitics affecting regulation of innovation and technological regionalization, advances and adoption of AI technology in a range of industries, and the pace of the green transition, which aims to alter the course of climate change and could drive demand in various parts of the market.

The 18 arenas of tomorrow we have identified could be even more materially transformative than the 12 arenas of today, shaping how we consume and process data, approach health and wellness, and interact and communicate with one another. They could introduce new options for our lives as well as new questions about our social progress, from the morality and ethics underpinning data and privacy to imperatives for businesses to be inclusive and sustainable. Recognizing how and when arenas originate, understanding how they evolve, and anticipating the way they could change society can offer a unique view of the arc of society's progress.

As we look forward, this report provides an initial view of where to expect the most growth and dynamism and how to update that view as the future takes shape. At the end of the report, we include a compendium that sketches the quantitative possibilities for the range of growth and the dynamism prospects of each of the 18 potential arenas of tomorrow.

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