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Seven Forces Reshaping Enterprise Software

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AT A GLANCE

Investor capital, Cloud 2.0, artificial intelligence, end-user power, data protection, preferred platforms, and a talent shortage are major forces transforming the enterprise software industry, leading stakeholders of all kinds to make big changes—and big choices.

Investors Weigh Future Opportunities

After healthy investments led to heftier deal sizes, company valuations, and money not yet put to work, investors must decide whether to change strategies in order to maintain or improve their returns.

Software Vendors Navigate Changing Strategy and Tactics

Thanks to evolving buyer demographics and sentiments, vendors are adopting digital-first sales and marketing tactics and more-stringent data protection policies.

Software Buyers Scale Digital and the Cloud

Companies have embarked on large-scale digital transformations. Cloud 2.0 is in full swing as organizations move on-premise solutions to hybrid- and multi-cloud solutions and redesign applications to be cloud native.

This report is based on "Seven Forces Reshaping Enterprise Software" from Boston Consulting Group in collaboration with Sand Hill Group.

It's been a while since enterprise software was an IT line item. That changed when companies deployed ERP systems and moved software spending to other business functions. Sales and marketing applications that simultaneously added revenue and cut costs raised enterprise software's profile and budget even higher. Today, it's hard to find a business function that's not using multiple cloud-based enterprise software applications—or in some cases, dozens of them. It's become so entrenched in organizations' services and strategies that it is now a key differentiator and a core competitive advantage.

As enterprise software's impact has increased, it's created an industry that is evolving, interconnected, and complex. It's also well funded, with a current market capitalization of about $1.9 trillion for just the top 20 value creators, as of the first quarter of 2019. But to prosper, industry players must make choices about strategy, funding, partnerships, spending, and operations and must overcome medium- and near-term challenges in all those areas. The sheer amount of funds raised for startup software vendors is contributing to high valuations and overliquidity at a time of increasing economic and regulatory uncertainty. Software buyers are navigating the adoption of hybrid- and multi-cloud applications, and powering broad digital transformations through artificial intelligence (AI) and related data initiatives. Software vendors are appealing to digitally savvy millennials, who constitute a large portion of B2B decision makers, while analyzing the best options for platform partnerships and addressing data privacy regulations and cybersecurity threats. Technology service providers are maturing from channel partners to innovation partners. And tech employers of all stripes continue to be dogged by a talent shortage and skills gap.

The large amount of funding for software startups is contributing to high valuations and overliquidity at a time of increasing economic and regulatory uncertainty.

The business environment has become more dynamic, and organizations must continually innovate and reinvent themselves to remain vital. For industry stakeholders of all kinds, the implications of these and other trends are very real. Either take action to keep up with how the industry is evolving and continue to thrive in an emerging new age for software, or fail to pay attention and face the threat of new competition or new technology taking over.

Key Forces Converging on the Industry

We analyzed BCG's latest research, industry data, and our work with both software vendors and buyers to gain insights into the major trends that are reshaping the en-

terprise software business today and their potential impact on stakeholders over the next 12 to 24 months. (See Exhibit 1.)

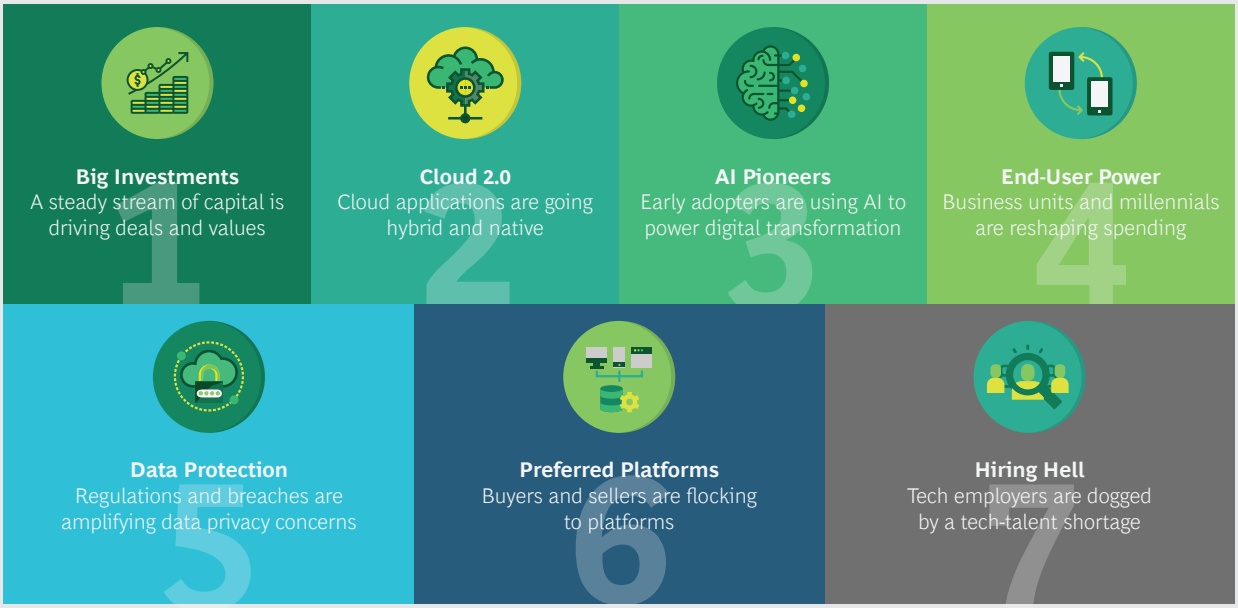
Force 1: Big Investments

A steady stream of capital is driving deals and values. Investors' appetite for enterprise software is growing, and they're betting big. The money pouring in is increasing both total funding and money not yet put to work, along with deal sizes and company valuations. In the past five years, venture capital and private equity investments have more than doubled, to $145 billion in 2018. Over the same time, a conservative estimate of the additional capital available for new investments in enterprise software close to doubled, to $150 billion, thanks in part to late-stage venture capital and private-equity investing mega-rounds.

The abundance of investors and capital, investors' appetite for larger deal sizes, and poor returns in public markets have led more enterprise software startups to stay private. In 2016, enterprise software IPOs dropped to a four-year low before recovering in 2018. Offerings in the works from companies such as Slack and Palantir Technologies indicate the uptick could continue. Despite that, according to Goldman Sachs, overall returns for private companies have outpaced those for public companies in the past two years.

To put more capital to work, investors are executing bigger follow-on deals—and doing more of them. In 2018, the number of private equity and venture capital add-on deals increased to more than 400. During the past two years, median deal sizes doubled. The need to put more capital to work has also led to an increase in buy-

Exhibit 1 | Seven Forces Are Shaping Enterprise Software



Source: BCG analysis.

outs. The number of these deals grew 15% annually in the past five years, to more than 600 in 2018, including buyouts of such startups as Apptio and Ellie Mae.

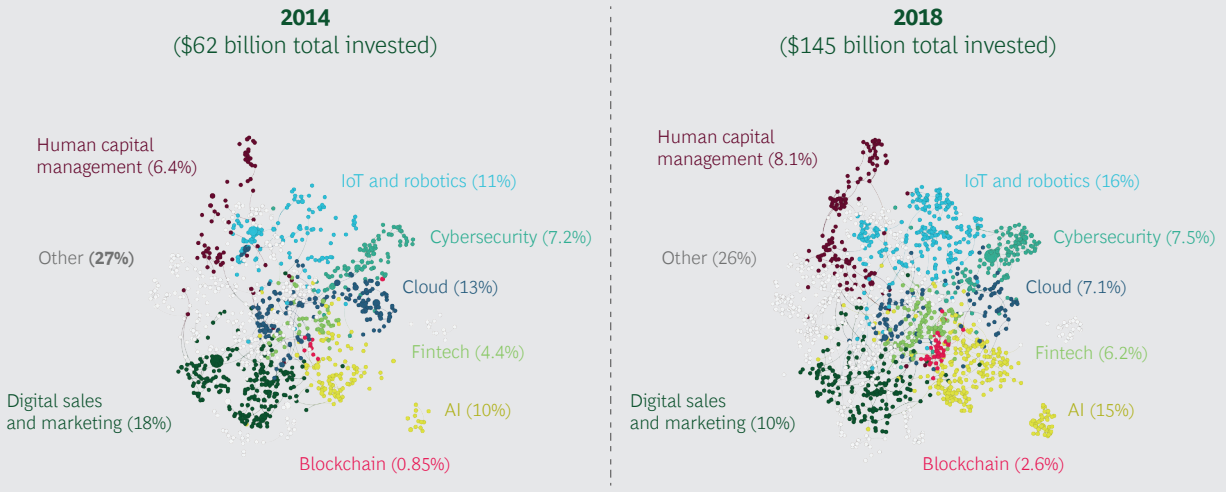
While investors have been amassing more capital, they've also been doubling down on investments in some specific emerging technologies. According to our analysis, from 2014 through 2018, the share of industry investment increased relative to overall funding growth in startups that were pursuing such technologies as blockchain, fintech, cybersecurity, and AI while declining in relation to the average in areas such as cloud and digital marketing. (See Exhibit 2.)

As investors look for new opportunities, we see more of them turning to potential new investment opportunities being created in countries such as China and India, which account for close to a quarter of the approximately 110 companies worldwide that reached unicorn status between January 2018 and February 2019. Startups headquartered in those countries also account for about a third of all unicorns' combined $250 billion value. That said, there's evidence that some investment hot spots might be cooling; in the last three months of 2018, venture capital deals for Chinese startups slumped by two-fifths, while private-equity financing dropped by more than a quarter compared with the previous three months, to under $10 billion.

Force 2: Cloud 2.0

For software buyers, Cloud 2.0 is in full swing, with more of them moving traditional on-premise applications to native and other cloud solutions. By 2020, more than 70% of corporate workloads are expected to be housed in public-, hybrid-, or private-cloud settings.

Exhibit 2 | Industry Investment Has More Than Doubled Since 2014



Source: BCG analysis.
Note: 2014 data n = 1,055 enterprise software companies (representative); 2018 data n = 1,474 enterprise software companies (representative). Each node represents a company, with the size of the circle reflecting the funding amount. Tight clusters represent a high number of commonalities between companies, while isolated clusters represent niche technologies.

Cloud adoption is accelerating across all verticals. In BCG's work with companies in regulated industries, we've also seen that more health care companies, finance firms, and utilities that previously may have avoided using off-premise applications for security and regulatory reasons are now betting big on hybrid- or public-cloud providers. In general, enterprises are pursuing hybrid- or multi-cloud provider strategies. In one survey, nine out of ten enterprises indicated that they expect to use more than one cloud provider to get best-of-breed functions, minimize costs, avoid vendor lock-in, or gain access to their preferred application or data architecture, among other reasons. At the same time that the use of public infrastructure-as-a-service (IaaS) and platform-as-a-service (PaaS) is continuing to grow, the market is becoming increasingly concentrated. By 2020, the top six public IaaS and PaaS companies globally will account for an estimated 93% of the revenue in that market segment. Microsoft Azure and Amazon's AWS division alone could own 60% of the market by next year.

Companies need to do more than just move to the cloud. To unlock its full value, they need to be cloud native.

To ensure that hybrid- and multi-cloud solutions work together seamlessly, enterprises are prioritizing integration, interoperability, and security. As a result, it has become a must to have a robust API strategy, security, and integration middleware that allow applications in different cloud environments to interact. APIs' importance is evident in how much their numbers have grown. From 2014 through 2017, the total number of APIs available in ten strategic business functions more than doubled. Interoperability's importance is also clear: the market for integration platforms is expected to grow by 50% to reach $2.8 billion in 2020.

Companies need to do more than just move to the cloud. To unlock its full value, they need to be cloud native, building and running applications that maximize the cloud-computing delivery model. Toward this end, companies are increasingly adopting DevOps and cloud-native architectures, including containers and microservices. Growth in spending on DevOps—software development and IT operations—shows just how far cloud-native applications have come. In one survey, 81% of enterprises reported that they were investing in cloud-native DevOps for use companywide, in business units, or by project teams. In another, two-thirds of companies said they are exploring the development of cloud-native applications, more than half expect to develop those apps in the next year, and a quarter plan to rebuild existing apps to make them cloud native.

Force 3: AI Pioneers

Early adopters are using AI and data as strategic assets to power digital transformation. The twin turbines of AI and big data could account for approximately 40% of the $1.7 trillion that companies worldwide are forecast to spend on digital transformation initiatives in 2019. And that's only the beginning. In a recent survey, most companies agreed that the pace of their AI and big data initiatives is increasing and that there is a sense of urgency to their AI investments. Expectations for AI are highest in industries such as technology, media and telecommunications, consumer goods, financial services, and health care. That mix includes both regulated and unregulated industries, more proof of the corporate appetite for AI in business transformation.

When it comes to that AI transformation, most companies are still finding their way. Only one in four AI adopters has realized significant value from its efforts,

according to BCG research. The rest are still figuring out how to be successful. Among companies that are AI "pioneers," the biggest stumbling blocks are attracting and developing the right AI talent and dealing with competing priorities that could siphon away investments from AI initiatives. Among "passives"—companies that haven't jumped on AI as quickly—the biggest challenges are unclear business cases for using AI, a lack of leadership support for it, and minimal or no technology capability in the area.

More companies adopt AI to boost revenue than to cut costs. Eighty-one percent of pioneers' AI initiatives focused on top-line growth, but a majority of passives also used AI to boost revenue. Taking a cue from B2C ecommerce giants, some B2B companies use AI to customize and personalize marketing and sales. Others use it to optimize pricing or create entirely new products, especially in areas such as cybersecurity and medical diagnostics.

On the cost-cutting side, companies have deployed AI and big data to automate tedious manual processes and perform predictive maintenance. For example, utilities and other asset-intensive industries can use machine learning to monitor assets and optimize maintenance and repair. Companies are also using AI to automate back-office and customer support processes and optimize their supply chain.

AI adoption has put a spotlight on data. AI is only as good as the data it's based on, a fact that has led companies to institute rigorous regimens to root out the causes of bad data. For many, the first step is hiring a chief data officer. The number of companies with C-level data leaders has jumped five-fold since 2012, to the point where two out of three now have such an executive. The most critical work, however, is building a solid foundation around data, leading companies to undertake data management projects to prepare for wider AI use. In 2018, half of them expected to work on data integration, compared with 34% in 2017. Companies also planned to roll out more projects in data preparation, enrichment, governance, cleansing, and holistic data quality, to name a few.

AI adoption has put a spotlight on data.

Building an AI strategy and redesigning business processes around it are what we refer to as adopting AI at scale. More than half of AI pioneers have directed an AI-based process transformation in the past three years, and three-quarters expect to carry out more of them in the next five years. At companies that are early AI adopters, 90% of managers have AI strategies and 85% believe the strategies are urgent, while only 39% of managers at passive companies have AI strategies and 57% feel they're important.

Force 4: End-User Power

Business units and millennials are reshaping spending. As more enterprise software moves to the cloud and platforms, it's leading to a change in how software is consumed. Buying power is shifting to business units and a new generation of buyers, as reflected in evolving software-purchasing behaviors. In 2019, spending on cloud-computing infrastructure and applications is forecast to increase 17.5%, twice the industry's overall growth rate. While IT departments still account for the lion's share of spending, business units have buoyed purchases of business function applications. Over the past five years, spending on department-specific point solutions has been especially strong in marketing, e-commerce, procurement, and risk management.

Software purchasing is also changing as millennials who grew up on social media, video, and other digital ways of engaging make up a larger portion of the B2B buyer base. Today, millennials constitute close to half of the decision makers researching B2B software purchases, an equal number use a mobile device to look up information during a B2B purchase decision, and nearly two-thirds are on LinkedIn.

Evolving enterprise software buying behaviors are changing the role of the CIO, who must collaborate and cooperate with business units to lay out a unified digital foundation and shape the company's digital agenda. Today, almost 40% of IT leaders say they're actively engaged with business units to identify and use technology that can change the way business is done. The same number of tech leaders also describe their role as transformational or strategic.

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Digital has become an increasingly critical part of the software sales process. The average buyer gets 60% of the way through the sales journey before the first live interaction with a company. According to one survey, four of the top six software-as-a-service (SaaS) vendor marketing strategies with the biggest impact on revenue are digital: content marketing, email marketing, SEO, and paid search. The trends have contributed to SaaS vendors spending more than half their revenue on sales and marketing.

The growth of subscription-based software sales also has changed the relationship between software buyers and vendors, who must now interact with customers for as long as they use an application. As a result, vendors are ramping up post-sale, online-based customer management, a phenomenon that is apparent in the growing demand for customer success management (CSM) solutions and the talent needed to run them. According to a recent BCG and Gainsight survey, more than three-quarters of companies that offer CSM solutions don't charge customers for them and, at close to two-thirds of these companies, the CSM function reports directly to the CEO or head of sales. As of February 2019, US companies had close to 270,000 open CSM jobs.

Force 5: Data Protection

Regulations and breaches are amplifying data privacy concerns. Countries worldwide are adopting strict data privacy regulations, led by the EU's robust General Data Protection Regulation (GDPR) and, in the US, California's Consumer Privacy Act, both passed in 2018. In a survey of 105 countries, more than 40% reported instituting stronger data policies and enforcement. Of those, more than half cited the GDPR as the reason. Emerging-market countries are more likely to have less stringent data protections, although some are tightening their rules, such as India, which is expected to enact legislation calling for stricter guidelines.

Tighter regulations are partially a result of data breaches, which have more than doubled in the past five years and reached 6,500 worldwide in 2018. Over the same period, the average amount of data exposed in a breach tripled, a possible outcome of the increasing value of digital information and the sheer amount of data being collected. Close to three-quarters of all breaches are caused by human, process, or organizational errors rather than by inadequate security technology, according to a BCG study.

Like breaches, misuses of customer and end-user data can be costly, and companies that opt to use data in new ways may end up at odds with their customers. The precariousness of data security and privacy isn't lost on CIOs. More than half believe that breaches are their organization's biggest security threat. As a result, CIOs say almost unanimously that privacy is their top data priority, followed by cybersecurity and data ethics.

Partly to comply with new regulations, enterprise software cloud players are expected to sink more money into data center investments; they spent upwards of $35 billion in 2017 alone. All major cloud providers are building out capacity in the EU to comply with GDPR restrictions. In addition, software companies are following "privacy by design" principles in product development, designing privacy features into new products to comply with regulations—for example, those passed in California in 2018, which require smart devices to have built-in features that block access by unauthorized users. Overall, we expect software companies to make significant investments in product development to comply with such data-related regulations.

We've seen an explosion of growth in privacy protection technology to capitalize on the pain points in this segment. Since early 2017, the number of vendors offering privacy technology has more than quadrupled. The market remains highly fragmented: 35% of vendors sell a single product, only 20% offer three or more, and no single vendor markets a completely integrated solution that covers all data-privacy-related needs.

Platforms are booming because of the value they create for the parties within their sphere of influence.

Force 6: Preferred Platforms

Buyers and sellers are flocking to platforms as value creation from ecosystems becomes the new logic for competition. Platforms and the ecosystems that have developed around them have become integral to how enterprise software is sold, used, and managed. Although many software companies continue to distribute through traditional channels and product partnerships, the industry is shifting to offering applications as part of platforms that offer the foundational architecture and core functionality that create the equivalent of a digital marketplace for hundreds or thousands of "complementors" and developers to congregate to do business. At the far end of the spectrum of modern software ecosystems, superplatforms are emerging such as Amazon AWS and Microsoft Azure, which function as platforms of platforms, aggregating tens of thousands of complementors' services and millions of developers.

Platforms are also booming because of the value they create for the parties within their sphere of influence. On platforms like Salesforce.com, more than half the economic value created goes to the platform partners. A platform ecosystem's value increases as its contributor community expands. To achieve this growth, platforms are investing heavily to attract developers to work on their sites and technologies. GitHub pursued that strategy to expand its developer community to an estimated 31 million, and Red Hat used it to boost its developer ranks to approximately 8 million.

Companies can use platforms strategically to extend their area of influence and, potentially, market share. When Microsoft wanted to build out its Azure superplatform, the company made it easy for existing enterprise license agreement holders to try it, which eventually led to mass adoption. Since 2016, the number of de-

velopers working on Azure has jumped 67%, to 2.5 million, while revenue has more than tripled. To show just how committed it is to developers, Microsoft also recently rebranded Visual Studio Team Services to Azure DevOps.

Force 7: Hiring Hell

Tech employers are dogged by a talent shortage aggravated by a skills gap and changing work preferences. Enterprise software growth has created a surge in jobs for people with in-demand digital skills. According to a LinkedIn report, the need is highest in job categories such as blockchain, machine learning, and data science. By the end of 2018, blockchain developer job openings were 33 times more numerous than the previous year, and openings for machine-learning engineers were 12 times higher. Although demand for tech jobs continues to grow in traditional tech hubs such as the Bay Area and Seattle, cities that have not been traditional tech strongholds are witnessing an uptick as well. Such places include Charlotte, where tech positions jumped 59% from 2012 through 2017, and Atlanta, where similar jobs increased 35% over the same time.

The new ways that people want to work have led companies to be more competitive in what they offer in order to attract talent.

Spiking demand has outpaced the available supply of talent. The top six emerging US tech-job categories had an aggregate 324,000 openings as of February 2019, including 270,000 for customer success managers, 22,000 for data scientists, and 16,000 for machine-learning engineers.

Feeding into the demand is a massive and persistent tech-industry talent gap, one where employees' skill sets in specific digital-related competencies lag employers' needs. Today's workforce lacks the majority of needed hard-tech skills, such as machine learning and blockchain development.

The new ways that people want to work have led companies to be more competitive in what they offer in order to attract talent. There was a time when employers could attract and retain the talent they needed by offering great pay, benefits, and perks. Now, purpose-driven work, diversity, and flexibility have become increasingly important differentiators. Tech talent is three times more likely to work for a company with purpose. More than half want flexibility in when, where, and how work gets done. And over two-thirds would be willing to relocate to a different area or country in order to advance in their career. These people also want ways of working that are anchored in digital, just like the rest of their lives.

Next-Wave Enterprise Software Trends to Watch

In addition to the major forces currently shaping the industry, we expect several newer trends that are gaining ground to become even more important in the course of the next three to five years, a reason to start planning for the effects they could have on the industry.

Blockchain

As blockchain's distributed-ledger technology matures, companies are beginning to develop applications and use cases that benefit their businesses. Blockchain is used primarily as a verifiable distributed record to create trust, which makes it advantageous in B2B settings involving multiple parties or transactions where trust is es-

sential, such as in the supply chain. For example, IBM and Maersk use private, permissioned blockchain to digitize, automate, and store important paperwork, reducing administrative expenses that would otherwise account for as much as 15% of the cost of goods shipped.

Although public blockchain is still early in its development cycle, it holds even more promise to solve customer friction and pain points, in such applications as public-sector systems of record, financial services payments, and universal-identification procedures, to name a few. Companies are already combining public blockchain technology with off-chain innovations such as large-scale layer two and layer three transaction processing and smart contracts to build disruptive applications such as low-fee payments and money transfers. Bakkt, for example, combines blockchain and off-chain innovations to make it easier for investors, merchants, and consumers to use and trade digital assets. When vendors evaluate incorporating blockchain into an application, they should weigh whether it would add greater value than would be created by using a more traditional technology, such as a high-performance database.

Services such as Siri, Alexa, and Google Assistant have paved the way for personal interactions with digital devices and software applications, a trend that's moving from B2C to B2B.

5G, Edge, and IoT

The emergence of 5G telecommunications technology is enabling applications and infrastructure software stacks to be optimized for edge computing. Furthermore, it's launching a new era of applications and leading performance-intensive business applications to be redesigned in order to leverage the infrastructure continuum from cloud to sensor. As IoT devices have become more abundant, platforms designed to manage them have started to mature. In the near future, we expect to see a proliferation of business applications that use IoT data to generate revenue and cut operating costs.

Interfaces

Services such as Siri, Alexa, and Google Assistant have paved the way for personal interactions with digital devices and software applications, a trend that's moving from B2C to B2B. Today, B2B software users can engage with vertical-specific applications via voice, augmented reality, virtual reality, or mixed reality interfaces. In one such application, field services technicians wear eyeglasses that overlay a digital map onto the object they're fixing, speeding up repair times and saving on training. In the next three to five years, look for interfaces to be available for more business applications, including audio interfaces that let the user ask a question and receive the answer through an earpiece or headphones and augmented reality interfaces that overlay digital data or images onto the real world.

AI Hardware Accelerators

As deep learning grows, it requires more-complex computations, leading to the development of hardware beyond traditional microprocessors that is optimized for AI applications, or what are more commonly called AI accelerators. Major tech players are already active in this area. In 2018, Google introduced its third generation of tensor processing units—a type of customized AI hardware—and Amazon began manufacturing a machine-learning inference chip. Intel also recently announced a field programmable gate array, essentially programmable hardware. In coming years, we expect to see a widening variety of AI hardware accelerators for both

horizontal and vertical solutions, including new developer tools and a host of applications for deep learning.

DevSecOps

As companies use more cloud-native applications and security threats increase, software developers are building better protective protocols into every stage of application development. DevSecOps prevention, detection, and responsive security processes and controls are applied across a product's life cycle to reduce the time needed to identify and remediate threats and vulnerabilities. One type of control is run-time application self-protection (RASP), which detects and blocks threats and vulnerabilities while full-stack engineering teams create a patch. In the near term, we expect security to become well integrated into the DevOps product chain, including new frameworks, platforms, and monitoring tools.

To deliver significant value to their customers, enterprise software companies have capitalized on recent trends.

Quantum Computing

Quantum computing operates on an exponentially higher information density than traditional computers, giving it the ability to solve problems that traditional computers can't tackle. Quantum computing's problem-solving prowess can be applied to a variety of industries. In industrial goods, for example, materials scientists could use it to create materials for better lithium-air batteries or energy-efficient fertilizers. In financial services, it could be used to run risk-based trading strategies that are beyond the ability of today's best supercomputers. In pharmaceuticals, it could improve molecular simulation and genomic sequencing enough to usher in an era of personalized medicine. Going forward, we expect to see quantum-computing standards and ecosystems evolve, software companies begin incorporating it into more products, and providers build quantum-technology platforms.

Digital Twins

Picture a bridge. Now picture a bridge created from digital trusses and girders instead of concrete and steel. Referred to as a digital twin, this virtual representation of a physical object or structure is increasingly being used in construction, industrial, health care, military, and other settings. A digital twin could be a functional model of an asset or a digital image that's rendered using data collected from sensors embedded in an object or structure. In the near future, we expect companies to use digital twins along with other software and APIs in business processes and analytics to deliver better outcomes.

How Enterprise Software Stakeholders Can Respond

To deliver significant value to their customers, enterprise software companies have capitalized on one or more of the trends that we've outlined. In fact, forward-leaning companies such as Adobe, Microsoft, Salesforce.com, and Workday have created enough value that they are among the 15 enterprise software industry players with the highest shareholder returns over the past five years, as identified in the 2018 BCG Value Creators rankings. (See Exhibit 3.)

For companies to deliver value, they need to pursue a specific action plan to remain vital that is anchored in three specific building blocks. The biggest driver of vitality is creating a balanced portfolio of bets that can fuel sustainable short-, medium-,

EXHIBIT 3 | The Top Industry Value Creators Bring Substantial Gains to Shareholders

Five-Year TSR Rank	2018 TSR Rank	Company	Location	Five-Year TSR (%)	Market Value ($billions)
1	4	Adobe	US	30.4	110.4
2	6	Palo Alto Networks	US	26.8	17.9
3	7	ServiceNow	US	26.0	31.9
4	8	Constellation Software	Canada	26.0	13.6
5	10	Red Hat	US	25.7	31.0
6	11	Cadence Design Systems	US	25.4	12.3
7	12	Microsoft	US	25.1	779.8
8	15	Intuit	US	22.1	51.1
9	18	Autodesk	US	20.6	28.2
10	23	Salesforce.com	US	19.9	104.8
11	28	Dassault Systèmes	France	18.9	30.3
12	38	Synopsys	US	15.7	12.6
13	40	Citrix Systems	US	15.3	13.8
14	45	Workday	US	13.9	35.1
15	62	Check Point Software Technologies	Israel	9.7	16.0

Sources: S&P Global Market Intelligence; annual reports; BCG analysis.
Note: TSR = total shareholder return. The 2018 rankings are based on 89 technology companies listed in *The 2018 Value Creators Rankings* from BCG; the five-year TSR is measured from January 1, 2014, through December 31, 2018; the market value is as of December 31, 2018.

and long-term growth. These kinds of bets require companies to embrace an entrepreneurial spirit and new ideas as well as a willingness to take chances on unproven models. To stay vital, companies must also think differently about strategy. They must take a long-term perspective that is focused as much on exploration as it is on exploiting existing business models, and they must think beyond traditional management and strategy models. Finally, companies need to build the right capabilities. This includes investing in technology, staying dynamic and diverse, and cultivating a sense of urgency in order to foster self-disruption.

Using these building blocks as a base and reviewing the trends outlined here and the best practices of companies on the Value Creators list, we identified actions that we believe industry investors, software vendors, software buyers, and technology service providers should consider taking to deliver the same kind of value.

INVESTORS

With enterprise software valuations running at a five-year high, investors must ask themselves whether they can continue to expect more of the same in the future or whether they need to change their strategies to maintain or improve returns.

Evaluate today's frothy valuation climate. Available capital, well-performing private markets, and competition have led to an overinvestment in the industry. At the very least, investors should carefully evaluate opportunities in oversubscribed categories such as AI, IoT, and blockchain. In addition, they could consider increasing invest-

ments in applications that have become integral to how companies operate today—for example, internal communication platforms such as Slack or IT operations platforms like ServiceNow.

Strengthen selective bets in emerging-technology markets. For investors, pockets of potential value creation are developing in countries outside the traditional software hubs of the US and Europe, including China, India, the Middle East, and Latin America. While nations such as China are already showing signs of overheating, emerging markets still have headroom. Vendors in those emerging economies are showing strength in specialized B2B solutions for what until now have been low-tech vertical markets.

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Determine how regulations could affect potential investments. Regulations typically deter investments. In an environment where more technology regulations are being proposed and passed, investors need to thoroughly assess the changing regulatory climate and the impact it could have on the companies in their portfolio and those that they are considering funding. If the companies aren't operating within regulatory guidelines, investors need to encourage them to find practical, cost-effective ways to do that. If possible, investors also should consider helping shape new laws or regulations either on their own or by supporting the efforts of industry groups.

Software Vendors

Today's software companies answer to multiple masters, including the investors that are sources of funding and the platforms that can provide a marketplace for their services. Most important are the buyers, whose changing purchasing habits and preferences are leading vendors to adopt digital-first sales and marketing tactics.

Weigh funding options. With large quantities of private financing still flowing, software vendor CEOs must evaluate the tradeoffs between pursuing a public offering and sticking with private funding sources. Because of the sizable amounts of yet-to-be-invested capital waiting in the wings and the strings attached to a public-stock offering—including more-stringent financial-reporting requirements and the possibility of investor activists—we expect software companies will choose to stay private longer and undertake fewer IPOs.

Prioritize data and data privacy in developing applications. Buyers don't just want data—they want help understanding what it means and to be assured that it will be protected and secure. Vendors' next generation of B2B applications must incorporate rich data assets to provide buyers with the insights that they want. For example, a growing number of human capital management applications include predictive analytics that can do things like sift through employee information to determine which individuals are most likely to leave for a new position. To address mounting concerns about breaches and privacy, vendors' new applications must incorporate stronger data controls, such as implementing design-for-privacy protocols into product life cycle management processes.

Focus on high-velocity sales methods suited to "as-a-service" business models. An increasing portion of the customer sales journey happens digitally. For modern SaaS vendors, 60% of the sales process happens before a customer's first

interaction with the company. Vendors today must optimize the digital sales experience that they offer in order to make sales quick and easy for business unit buyers, including digitally savvy millennials. Vendors can offer graduated levels of digital support depending on the purchase price: for example, digital self-service for low-cost services, inside sales for midrange offerings, and face-to-face interactions for the largest sales. Vendors also should invest in CSM to continually engage with business users. That could include creating clearly articulated customer success points of engagement, investing in telemetry and measurement to ensure that CSM efforts work, and being proactive about selling software subscription renewals and taking advantage of opportunities to upsell and cross-sell.

Align with platforms, but use caution. As platforms create ever-larger ecosystems, vendors must decide which to partner with in order to maximize their own sales. They must also determine how to use platforms to stay competitive without becoming overly dependent on a single provider. By playing the field, vendors could be better able to protect their prices and defend themselves should a platform provider launch a product that's a direct competitor.

To address the talent shortage, companies might need to move some operations to the tech hubs that are emerging around certain specialties.

Tap reskilling and talent hubs to fill talent needs. Companies can address the ongoing talent shortage through reskilling, a strategy that approximately 40% of them have started to implement. Early results for employers that have initiated reskilling initiatives indicate that they are able to fill 30% to 40% of all roles with internal candidates, mitigating the need for outside recruiting. Companies might also need to move some operations to the tech hubs that are emerging around certain specialties. For multinationals, it could mean looking for talent in hubs such as Delhi, where robotics are strong, or in Berlin, which is a hot spot for cybersecurity talent. Vendors and other tech employers must redesign their corporate culture to cater to the preferences of tech talent, including a desire for purpose-filled work and flexibility in how work is done. They can also take steps to be more diverse and inclusive but need to make sure such efforts are successful. BCG research has shown that the vast majority of companies have instituted diversity programs, but only a quarter of women and minority employees think they're better off as a result.

Software Buyers

Buyers have a lot to deal with these days. They face an evolving vendor landscape and a myriad of options for cloud environments and business applications. To make the most of the options they select, they need to build strong data and cloud architectures, adopt agile ways of working and experimenting, and focus on what generates the most value.

Create an agile-based foundation to build solutions that use new cloud and data architectures. To launch digital solutions and drive innovation, business and IT need to work together in an agile and iterative way, including using dedicated cross-functional teams that work in sprints to build and test products. Teams must adopt new tools such as DevSecOps to automate releases, speed innovation, and improve software quality and also must learn and improve as they proceed down the implementation path.

Build a robust cloud strategy. Hybrid- and multi-cloud services are creating a new set of challenges for buyers, including resiliency, data propagation and synchronization, disaster recovery, and governance. Buyers must invest in hybrid- and multi-cloud interoperability, security, orchestration, and operational tooling. As part of that, they should invest in DevSecOps to change the way that they build and run applications. Buyers eventually should redesign their applications to be cloud native, including adopting serverless, functional, and container-based microservices architectures. They must also consider the consolidation happening in the cloud market and the potential impact that fewer vendors could have on cloud-services options and costs.

Prepare data to maximize AI. Along with building AI and data capabilities, CIOs need to invest deliberately in the information architecture necessary for data management and data infrastructure. Data management covers areas such as data quality, metadata management, and data lineage, while data infrastructure comprises areas like data lakes, data security, and data location. To fully realize AI's value, organizations need to transform by holistically examining their operating model, including machine architecture, organization structure, and people management.

For software vendors, tech service providers are maturing from channel partners to innovation partners.

Upskill talent. The digital transformations that enterprises need to make will be possible only if they have enough people with the needed skills. CIOs can close the talent gap through expansive reskilling initiatives and by taking other steps that are similar to those outlined for software vendors.

Technology Service Providers

The current climate of digital change and the talent shortage are creating opportunities for technology service providers, which are in a unique position to help both software buyers and vendors.

Guide clients through digital transformation. Today, buyers need help making sense of and prioritizing the many options they have to migrate to a hybrid- and multi-cloud environment and adopt AI at scale. Service providers can also help clients stay abreast of the privacy protection technology that's appeared in the wake of increased cybersecurity threats and assist them in putting together integrated solutions from multiple data privacy offerings.

Engage with software vendors to help them innovate. For vendors, service providers are maturing from channel partners to innovation partners. Service providers can draw from their knowledge of software buyers' challenges, concerns, and pain points to help vendors innovate faster, drive better product market fit, and implement digital sales practices. Service providers should also consider creating point solutions where none exist in the market.

Bridge the talent gap for both buyers and vendors. Service providers can provide not only specific product teams but also supplemental staffing to both vendors and sellers. They can draw from their internal workforces of highly skilled labor, which depending on the company, may number into the tens of thousands of people. Service providers have undertaken significant initiatives for their own enterprise-

wide upskilling and reskilling initiatives. The teams and people that they make available for client engagements can bring much-needed tech skills to vendors and buyers.

THEY SAY THE only constant is change. That could describe how the industry is grappling with major changes on multiple fronts—new investors, investment opportunities in emerging markets, cloud options for B2B buyers, and new digital-first ways of selling for vendors. For long-time industry stakeholders, findings about a widespread migration from an old technology sales and distribution method to a new, more promising one could feel like déjà vu. The data security and privacy concerns aren't new either—but these issues have taken on increased gravitas as the business world reacts to tighter regulations and data breaches. The tech-talent shortage is also a familiar problem. But broader adoption of corporate digital transformation is creating new tech jobs and adding to the demand. While investors, buyers, vendors, and technology service providers must deal with day-to-day concerns, they also need to keep one eye open for the shifts that are just around the corner. The exact timing of what's next might not be clear, but there's no doubt that change will continue to come.

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