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A primer on Web3 adoption for enterprise

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Introduction

In the fast-paced, interconnected world of today, nothing stays the same for long. Technologies continually evolve and mature to anticipate the forthcoming needs of society. That is particularly true of the World Wide Web, and its next iteration is already here. Known as Web3[1], it is reconfiguring ownership, data sharing, participation, and self-expression to look radically different for users and participants. For their part, enterprises and corporations should stay apprised of these developments so they can work to help ensure their place in a Web3 world.

The advent and continuous evolution of the internet has transformed the lives of billions of people in a myriad of ways. That includes enhanced connectivity among individuals and increased access to knowledge, as well as a variety of services that may have been unimaginable without a connected world. Nevertheless, with progress often comes unintended consequences and potential dangers. For example, many services and transactions over the internet ask users to trust operators and surrender control over sensitive data. In recent years, what once may have seemed an acceptable trade-off is now, for many consumers, a subject of concern, notably regarding privacy and control of personal data.[2]

Along with other factors to be discussed on the following pages, the growing unease about data ownership and the need for trust in an anonymous global marketplace have contributed to the next evolution of the internet: Web3. According to *Harvard Business Review,*[3] "Web3 is being touted as the future of the internet. The vision for this new, blockchain-based web includes cryptocurrencies, NFTs, DAOs, decentralized finance, and more. It offers a read/write/own version of the web, in which users have a financial stake in, and more control over, the web communities they belong to. Web3 promises to transform the experience of being online as dramatically as PCs and smartphones did." By using blockchain technology, Web3 enables secure, transparent, and trustworthy transactions among complete strangers without intermediaries. While it offers this strong value proposition, one survey notes that only 8% of users globally consider themselves very familiar with the concept of Web3.[4] This statistic is likely symptomatic of the challenges enterprises may need to overcome in Web3 and enterprise blockchain adoption.

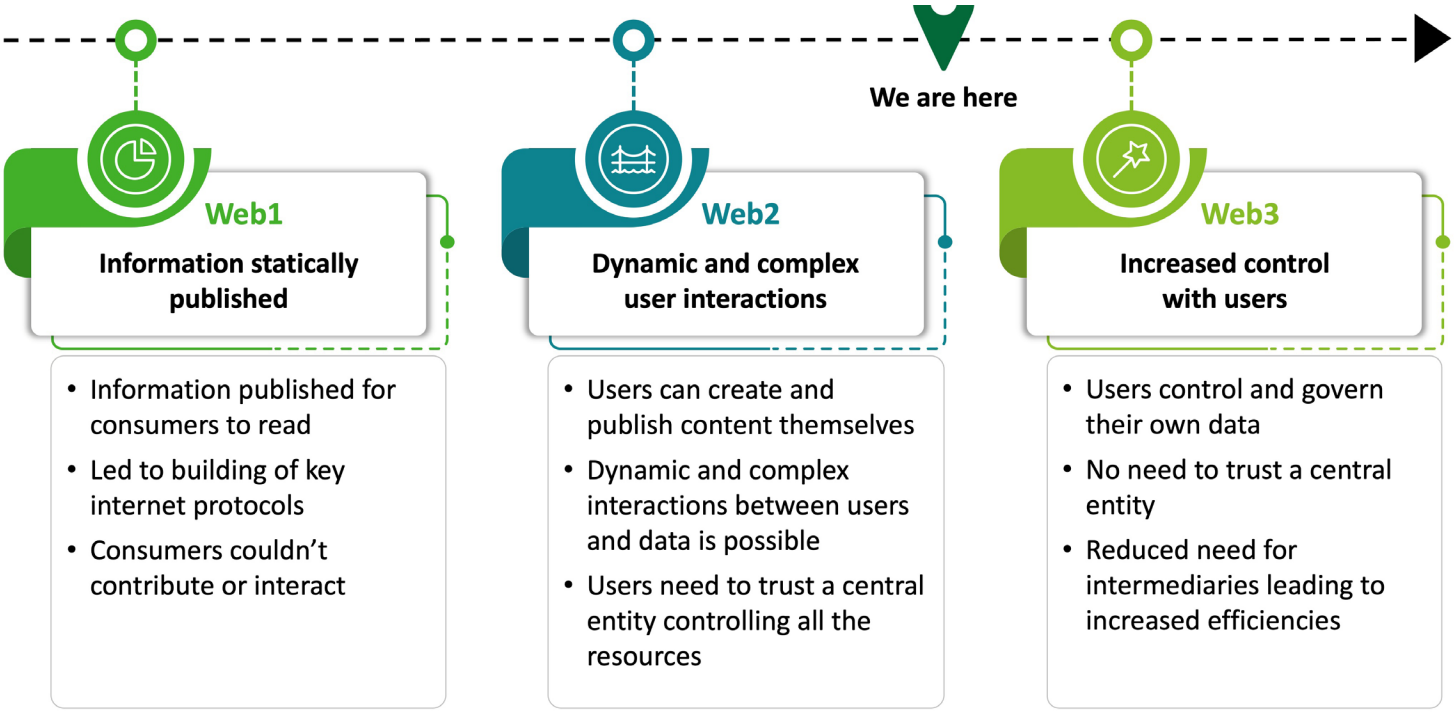
Although in its early stages, Web3 adoption is building momentum as enterprises begin establishing a presence in Web3. According to a recent report on Web3 adoption,[5] "315 brands launched a total of 526 Web3 projects in 2022 and Q1 2023." The report highlights the continued interest and investment in Web3 technology by top-tier brands, with 40% of projects still operational beyond the first year. The report also suggests that real-world adoption of Web3 technology will continue to increase, as more brands explore the potential of this new technology.

This paper aims to help enterprises better understand the nature and opportunities of Web3 enabled by blockchain technology, the key challenges in adoption, and how they can begin the process of integrating it into their business's strategy to stay competitive.

What is Web3?

Figure 1 encapsulates the evolution of the internet or World Wide Web. It began by publishing static information for broad consumption, moved to enable dynamic user interactions, and is currently recasting itself to provide greater user control and options.[6]

Figure 1. Evolution of the Internet



Web1 represents the early days of the internet when enterprises were publishing information online for the benefit of their end users. Static websites and digital online forms were the principal vehicles for collecting user information. These early days helped establish key protocols and standards that cleared the way for the next iteration of the internet. Still, there was limited interaction between the user and the applications. Even seemingly interactive digital forms required the manual handling of information on the back end.

Web2 transformed the internet by enabling users to partake in dynamic and complex interactions. They could now create and publish content themselves and share their data with other entities. This sparked such use cases as the purchase of groceries online, video calling friends overseas, ordering a car or taxi from a smartphone, binge watching streamed movies on demand, and more. That progress often required the sharing of data with seemingly anonymous enterprises and may have contributed to the loss of control over one's information and privacy.

Web3 constitutes the next evolution of the internet. It can offer users the ability to own their experiences, create new ones for customers and counterparties, and enable them and entities to interact without a need for trust. This is because the core constructs of Web3[7]—blockchain-enabled cryptographic securities, digital assets supported by "trustless" representation of information, and smart contracts facilitating complex processing of information—can provide the necessary assurance and trust framework. This paradigm shift could create opportunities for new economies and business models, can reduce intermediaries, and makes existing processes more transparent and efficient while also permitting interactions with customers in new and meaningful ways.

Some key Web3/blockchain use cases include:

- Peer-to-peer monetary transactions.
- Improved liquidity and speed of settlement for financial assets.
- Digitalization of real-world assets for better recordkeeping.
- Retention of data ownership.
- More transparent and auditable recordkeeping.
- Creation of digital ecosystems where Web3 enterprises and participants can interact without the need for implicit trust.

Web3 offers the possibility of numerous benefits and addresses key concerns of today's companies and consumers. Companies may no longer be able to afford to sit on the sidelines and should embrace the competitive advantage offered by Web3. Despite these potential benefits, wide skepticism may be slowing enterprise Web3 and blockchain adoption.

Why the skepticism toward Web3?

Innovation typically meets with some skepticism. Whether it's electricity, the telephone, or the internet, all these innovations faced the headwinds of skepticism before mainstream adoption. Web3 is no different. Some of the reasons for the current skepticism include:

- A lack of understanding of the technology and how it works.
- An absence of regulatory clarity.
- The mistaken equating of blockchain and Web3 with cryptocurrency.
- The multitude of financial scams.

These may be valid concerns. Yet skepticism can create the necessary conditions for pressure-testing the boundaries of new technology and for better identifying incentives that could attract constructive participants to the ecosystem. On the technology front, there are numerous frameworks, libraries, and software development kits (SDKs) that facilitate technical onboarding. It is noteworthy that some of the major cloud providers[8] now offer blockchain infrastructure as a service to simplify technical setups.

On the policy front, the March 2022 Executive Order (EO) on Ensuring Responsible Development of Digital Assets[9] directed federal agencies to study and coordinate their response to the Web3 ecosystem and provide legislative recommendations to Congress.

Issued by the White House, the EO was the first major US government policy statement in response to the rise of the Web3 ecosystem and digital assets. Given the implications of the EO and other government statements and publications, it could be appropriate for both enterprises and users to investigate Web3 solutions and ecosystems while adopting strong internal controls that are in line with industry-recommended leading practices.

What have we learned so far from the market dynamics behind the part of Web3 known as cryptocurrency? One lesson is that we should move ahead in Web3 informed by a robust skepticism while also embracing, and not negating, its positive attributes. Even the most ardent supporters of blockchain technology should be alert to the risks of this space but also open to adopting robust frameworks to minimize those same risks. Many entities[10] and enterprises are making meaningful strides in this area and are putting cryptocurrency within the proper context of blockchain and Web3. Crypto is not the whole picture with regard to Web3.

What are some challenges to Web3 adoption?

It's important to understand that the transition to Web3 may not be quick and simple. Rather it could take place as a natural evolution meant to integrate the new technology with the existing infrastructure. There are still major challenges, both from the business and the technical perspective, that should be addressed before Web3 adoption at scale can become feasible (figure 2).

Business challenges

Let's now turn to consider some of the key business challenges.

Regulatory challenges

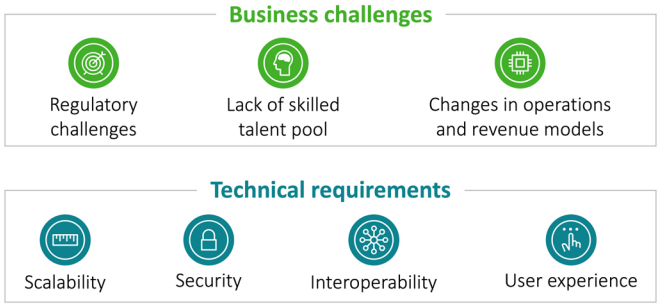
The lack of regulatory clarity could make some end users and enterprises wary of adopting Web3, especially at scale. And that hesitation can be compounded by the fact that digital assets are often embedded in the Web3 solutions. In the United States alone, a host of regulatory bodies have weighed in on Web3. They include the Securities and Exchange Commission (SEC),[11] Commodities and Futures Trading Commission (CFTC),[12] Financial Crimes Enforcement Network (FinCEN),[13] Internal Revenue Service (IRS),[14] Federal Trade Commission (FTC),[15] Office of Foreign Assets Control (OFAC),[16] Financial Accounting Standards Board (FASB),[17] and Public Company Accounting Oversight Board (PCAOB),[18] as well as many state regulators.

Despite the guidance they have provided, the clarity necessary to promote the wider adoption of Web3 remains elusive. Momentum is nevertheless building. Beyond the 2022 Executive Order referenced above, the recent issuance of crypto regulations by the European Union's Markets in Crypto Assets Regulation (MiCA)[19] may prompt US regulators to provide further and more definitive guidance. Given current conditions, one course for US enterprises could be to undertake small projects to learn and test systems and processes so they can be ready to scale up when there is greater regulatory clarity.

Lack of skilled talent pool

The absence of skilled talent is another challenge to Web3 adoption. According to data released by Block Research,[20] between 2019 and 2020, the number of blockchain-related jobs increased by 351%—from 18,200 to 82,000. That was followed by an increase of 118% between 2020 and 2021. The demand for blockchain capabilities and talent is undeniable. In response, some universities[21] and colleges have introduced curricula tailored to blockchain. Enterprises are increasingly upskilling employees through blockchain training. According to Deloitte's *2023 Global Human Capital Trends: New fundamentals for a boundaryless world,*[22] "74% of respondents believe that the development of new skills and capabilities is strategically important in their organization."

Figure 2. Business challenges and technical requirements of Web3 adoption



Bearing in mind the ongoing talent shortage and the pace of digital disruption, enterprises should consider investing in the training and development of in-house talent. That could provide them with a competitive advantage in deriving current and future value from Web3 applications.

Changes in operations and revenue models

As Deloitte's 2023 *Global Human Capital Trends Report*[23] indicates, the workplace of the future relies on a "co-create relationship" in which the organization and employees work to achieve mutual benefits. That differs substantially from the traditional model whereby the corporation owns the assets and workers have limited autonomy. Web3 is helping to alter the traditional model. Its decentralized nature is important to creating new solutions—for example, governance tools that provide employees with a larger say in the direction of the enterprise; or feedback solutions that capitalize on the collective wisdom of the group in helping to formulate and meet a business's goals.

Web3 can also serve to introduce innovative revenue models. They can include raising funds through token offerings, selling "utility bearing" digital assets such as non-fungible tokens (NFTs),[24] earning revenue through secondary sales of NFTs, real-time revenue sharing through smart contracts and programmable funds, and/or the lending and borrowing of "on-chain" digital assets. These revenue models could disrupt current frameworks. But they can also present the enterprise with additional and ever-evolving tax and accounting considerations. All that may give enterprises reason to pause.

Furthermore, these new models may be affecting the way enterprises attract, cultivate, and engage their customers. Thanks to the open nature of Web3 applications, customers can have increased control over their data, and the switching cost for customers to a company providing those blockchain-based protections is often very low.

For their part, to attract new customers and reward loyal ones, enterprises should provide token incentives, find ways of partnering with other projects to maximize network effects, and commit to continuous improvement to keep providing value to their customers. In the same vein, Web3 can allow businesses to build relationship-based business models with customers whereby customers can have a voice, as well as a share of revenue in projects, by owning tokens. And while enabling customers to benefit from some type of revenue sharing and/or ownership through tokens may represent compelling new business opportunities, these arrangements could also carry several implications—notably in terms of tax, compliance with financial crime laws, and possibly securities law.

Technical requirements

Over the past several years, blockchain, the technology supporting Web3, has benefitted from significant technological advancements[25] and enhancements thanks to innovation and evolutionary change, as well as greater adoption. As enterprises entertain the idea of adopting Web3, they should evaluate blockchain technologies in terms of both their business and technical requirements. Here are some of those considerations:

Scalability

Blockchains have the ability to process many transactions per second but currently process at a rate slower than most conventional systems. This reality has been a deterrent for enterprises dealing with large numbers of users and large volumes of transactions. Several scalability solutions, such as Layer 2s (see more in the section "Interoperability") and higher performant blockchains, have been developed as potential solutions. Some of these still face challenges such as the potential of future congestion, reduced decentralization, or limited adoption by developers and projects.

Nevertheless, these solutions are rapidly improving and making scalable Web3 enterprise performance a reality. In this context, enterprises should carefully evaluate various protocols/platforms to identify the one that could best meet their current and future scaling needs.

Security

There are several potential security concerns facing Web3 technology. Applications deployed on blockchains as "smart contracts" are "immutable" once implemented. That can make vulnerabilities discovered in usage more difficult to patch or update, and potentially easier to exploit. Furthermore, depending on the access rights of the network, all data and transactions may be visible to the entire network. In the case of poorly designed data models or in the event of data leaks, users' privacy and data might be exposed to malicious actors. It may be no surprise then that the Web3 ecosystem has been subjected to numerous phishing attacks[26] as well as asset thefts, many receiving media coverage.

Fortunately, there are secure coding practices[27] for blockchain that can help mitigate many of these risks. As enterprises develop their blockchain-based applications, they should adopt robust security measures. That could include the engagement of independent parties to conduct smart contract audits that can minimize the chances of security incidents.

Interoperability

Currently, multiple Layer 1 and Layer 2 solutions are vying to be the market leader[28] in the blockchain space. Each chain provides a value proposition and has its advantages for certain kinds of projects.[29] One of the stumbling blocks to the broader adoption of blockchain is that different platforms often use distinct protocols and standards, making interaction and communication between them uncertain. For instance, it is not currently possible to transfer assets and data between different blockchain protocols without the use of cross-chain bridges, which often have security weaknesses and are targets for being a "honey pot" of accumulated value.[30] Still new protocols could introduce new innovations in cross-chain bridging, which bring greater utility and security. The choice of technology may depend on whether the enterprise will need cross-chain interactions on a regular basis or not.

User experience

A complex user experience[31] has affected the speed of Web3's adoption. Currently, the on-ramp to Web3 is not a one-click solution for users. For example, there is a need for a simple and intuitive Web3 wallet that minimizes the complexities of private key management and network selection, as well as asset management. Moreover, these wallets and applications should furnish simple and clear explanations of the on-chain transactions to which users are attesting (signing). That is especially needed since Web3 applications operate on the native mobile platforms. For Web3 to attain widespread adoption, the user experience should be seamless.

Regulatory compliance

While tax and accounting may not be top of mind in the design phase, these considerations can be important to assessing the feasibility of the use case and developing compliant and scalable solutions. For example, the reporting of certain information, in addition to indirect tax laws, may require that users identify themselves and their location. If a decentralized platform is not designed to collect such information, it may subsequently face noncompliance issues as well as incremental challenges to collecting the data afterward. Contracts executed without due consideration of financial reporting may also result in unexpected accounting conclusions. Enterprises should consider incorporating internal controls during the development phase rather than attempting to bolt them on later when a business is already operating. Despite the obstacles outlined above, significant progress has been made. The next section discusses those areas in more detail.

What's ready now?

Scalability

As discussed earlier, one challenge facing blockchain is its lack of maturity in processing a large volume of transactions. At times, that results in delayed transaction processing and fees. Fortunately, there are various solutions and workarounds available to help address these shortcomings. They include:

- Technical improvements in Layer 1 blockchains, such as novel consensus mechanisms, sharding (which separates large data sets into smaller, faster, more easily managed parts), etc. that can enable higher transaction throughput on the Layer 1 chain. ("Throughput" refers to the rate/speed at which a blockchain processes transactions, often expressed in transactions per second, or TPS.)
- High-performant Layer 1s that prioritize the handling of higher transaction volumes while relinquishing on decentralization to some measure to facilitate that goal.
- Scaling solutions, such as sidechains and Layer 2s, that are built on top of current Layer 1 chains and that bundle transactions to enable higher transaction volumes.

Each of these solutions provides different value and requires certain trade-offs. But these protocols are mature enough for many projects that require speed and scale.

Security

The blockchain ecosystem has seemed to learn from security breaches. There is evidence that industry-wide standards and security frameworks are emerging. Companies such as OpenZeppelin, Waves, CertiK and others provide standardized smart contracts for implementing common logic. Various technology foundations[32] that developed Layer 1 blockchains have released industry-accepted guidelines, such as those for Ethereum Request for Comment (ERC), to help standardize on-chain applications. Others have created "bug bounty" programs to encourage researchers and white hat hackers to find and report critical bugs. Finally, multiple firms that audit smart contracts are helping enterprises vet their code before deploying their contracts on the chain. These efforts have progressively reduced security risks, and they help advance the adoption of Web3.

Developer tools

Web3 developer tools have made immense strides in short order. Various infrastructure providers, including all the major cloud providers, now offer blockchain infrastructure as a service. That can help make it easier for enterprises to spin up their Web3 applications. In addition, there are now several libraries, frameworks, and SDKs available[33] to speed up the development of both Web3 applications and blockchain use cases—everything from financial applications and the adoption of digital assets to enterprise transformation through blockchains. Tools like code editors and integrated development environments have matured and become easier to use. These advancements are contributing to a pathway for enterprises to adopt Web3.

Financial applications

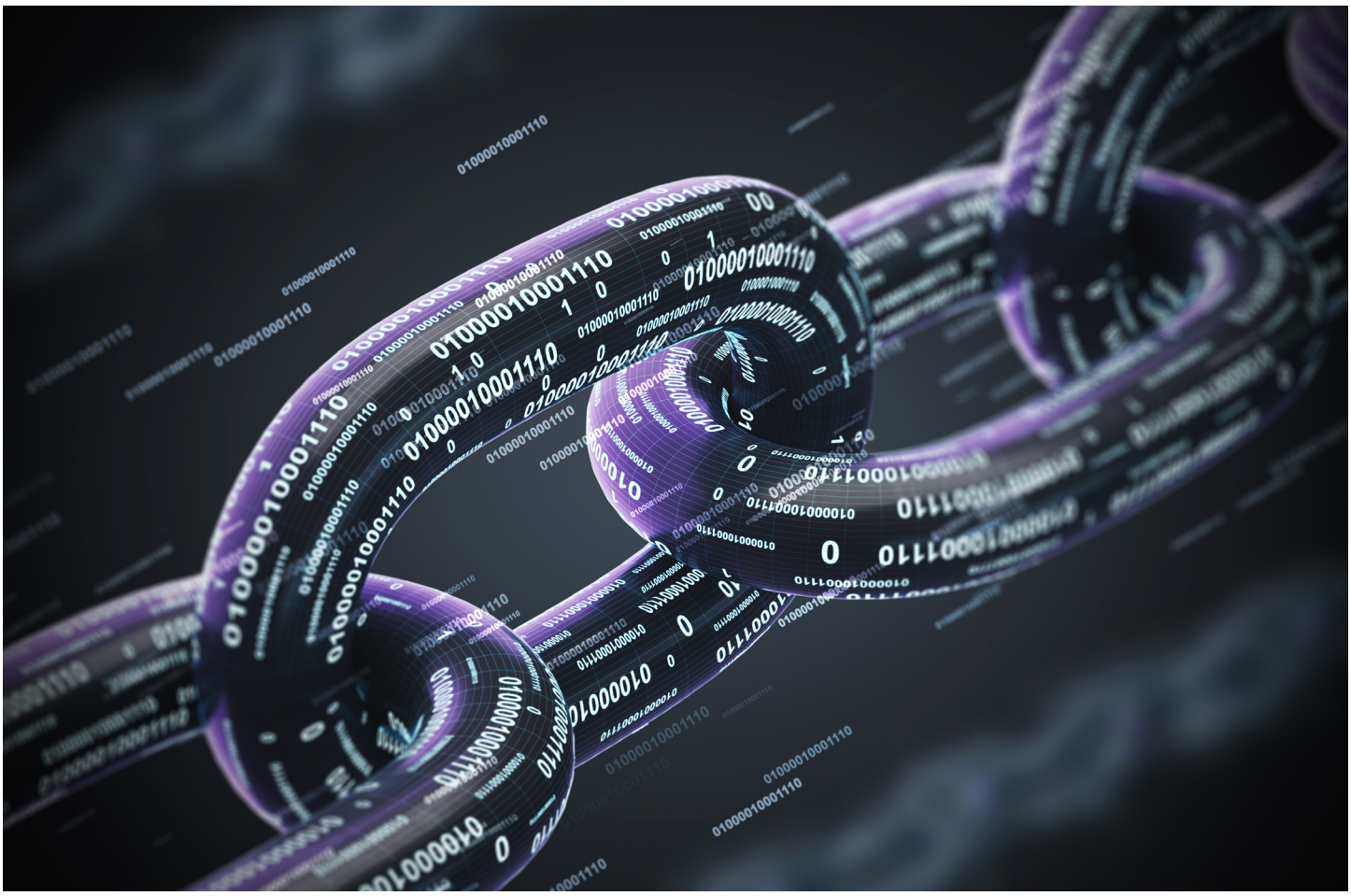
Consumers and institutions in many countries can now enjoy the ability to buy, sell, and hold cryptocurrencies. For their part, traditional financial firms are further exploring investment in digital assets thanks to improved institutional-grade custody solutions. Beyond that, Web3 has helped to improve traditional financial applications by providing access to retail investors and helping them to use digital assets to reduce settlement times and simplify global and cross-border transactions. Finally, decentralized finance (DeFi),[34] which facilitates peer-to-peer financial transactions, has emerged as an alternative to traditional financial industry functions, especially among under- and unbanked populations.

Digital assets

The adoption of digital assets, such as NFTs and other types of crypto tokens, can open new avenues to the tokenized economy. Traditional assets like art, real estate, precious metals, and even intellectual property can be tokenized and traded more readily and cheaply than the more expensive underlying assets. This can enable token creators and their owners to extend market reach by introducing features such as fractional ownership. Although tokenization precedes blockchain as a concept, blockchain technology can improve the security and transparency of ownership while also allowing for the integration of additional features into the tokens through smart contracts. That potentially includes automatic access to specific services or communities. Digital assets are also providing enterprises with incentives to attract new customers through such programs as customized rewards while also engaging with current customers through loyalty and ticketing programs powered by NFTs.

Enterprise blockchains

A promising use of blockchain technology takes the form of enterprise blockchains. A type of private blockchain, it operates in an ecosystem in which participants are independent actors and no one participant controls the network. Such an ecosystem provides controlled access to the network while retaining vital dimensions such as security, immutability, and the absence of any implicit trust structures. Enterprise blockchains can help resolve otherwise challenging problems such as data governance, while making it easier to identify and neutralize malicious actors who compromise data; and they can prevent parties from modifying records while creating the requisite visibility for transactions among participants. For example, enterprise blockchain solutions can help streamline supply chains by enhancing security and trust, can facilitate the protection of personal data (such as medical records), and can help governments, among others, better protect and more effectively use citizen data.



How to get started?

After coming to terms with the challenges of Web3 adoption, the biggest question that remains may be how to get started and engage with Web3 and the underlying blockchain technology. Let's begin by answering some foundational and strategic questions for executives and leaders to consider.

- Is blockchain a good fit for my company's use case?
- Should the company build, buy, or work with others to develop the appropriate solution?
- On which protocol/platform should the company build its Web3 project?

Is blockchain a good fit for my company's use case?

Blockchain is not the solution to every problem. That's why it can be essential to determine whether the use case under consideration can truly benefit from a reliance on blockchain.

The first step is to establish whether the use case aligns with the benefits of blockchain. Consider these questions:

- Are multiple "non-trusting parties" likely to be involved?
- Does the data need to be accessible to multiple parties?
- Is there a need for accountability and auditability?

If the answers to these questions are "yes," then blockchain may be a good fit.

Second, it's important to evaluate whether alternate technologies can better serve the company's use case. For instance, if the use case requires the central processing of very high volumes of data at high speeds, then more conventional databases may well be a better fit.

Finally, an enterprise should ascertain how and whether the use of blockchain aligns with their overarching business goals. That includes whether the blockchain solution can be deployed in time to meet business needs; whether it, and the skills associated with it, are transferrable to other Web3/blockchain use cases in the future; what outcome or ROI can justify the investment; and finally, are the business's leaders aware of, and ready to address, the potential legal, reporting, and security risks with Web3 adoption?

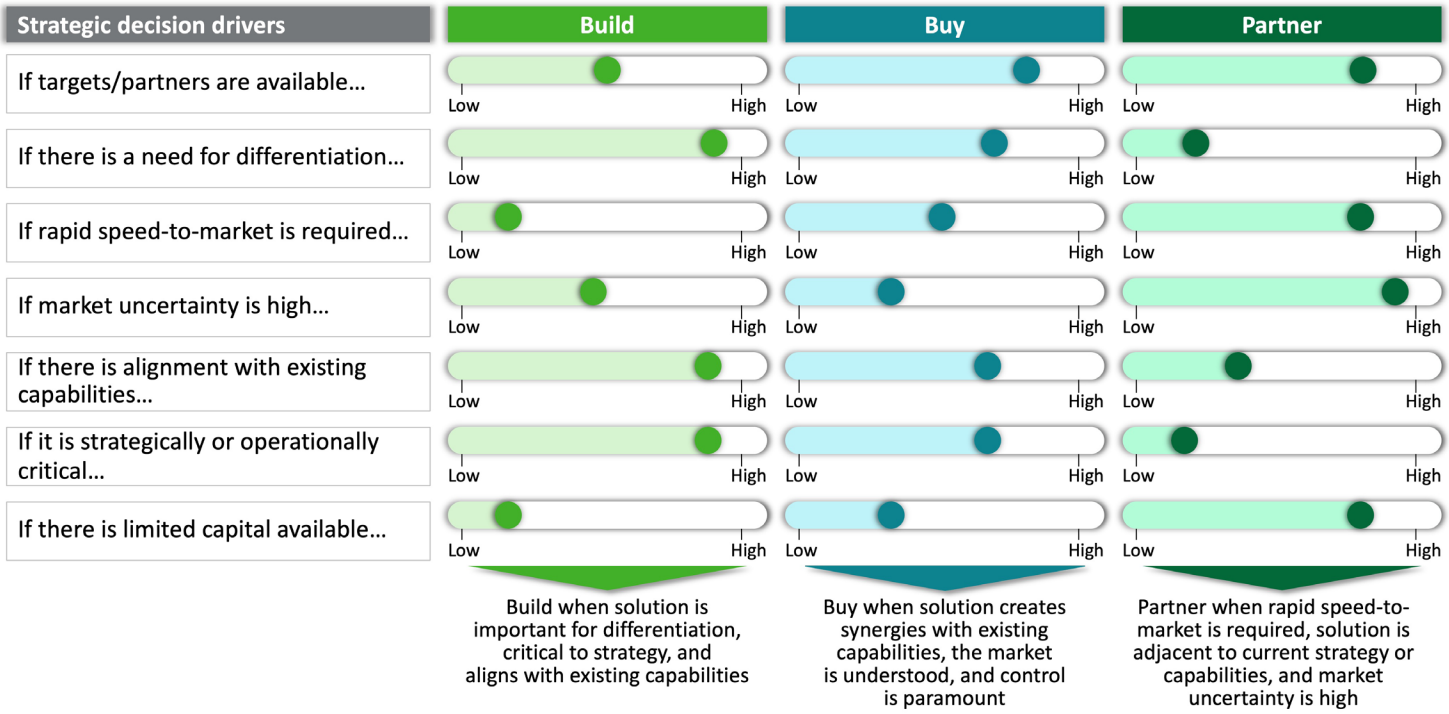
Should my company build, partner, or buy?

Before proceeding with any decision, it's important that the enterprise evaluates its current skills and technology stack to determine whether it's feasible to implement blockchain-based solutions. To enable the use case to perform most effectively, the company should have either a team skilled in blockchain development or the ability to buy from/work with other enterprises that can provide those services.

The table in figure 3 sets out the main advantages and related considerations that could factor into a decision to build the solution in-house, work with another enterprise that has the requisite experience, or buy an existing solution.

Figure 3. The build-buy-partner framework

A company's decision to build, buy, or partner may be evaluated based on key strategic decision drivers and the suitability of each option given these drivers.



Which protocol should my company build on?

So, which blockchain protocol is the best fit? There are a multitude of Layer 1s, Layer 2s, scaling solutions, and enterprise solutions to pick from; each offers different capabilities and advantages. These next sections can help your company evaluate these protocols.

Scalability

Blockchains typically have different transaction throughputs and fees. Some protocols have improved scalability thanks to technical improvements or enhancements to the consensus mechanisms.

For example, enterprise blockchains generally use a very "lightweight" consensus mechanism since members are "admitted" to the ecosystem and are subject to the authentication of their identity before accessing the system. These lightweight consensus mechanisms can process many more transactions per second since they don't have to contend with time-consuming algorithms to ensure that the transaction is valid and written to the blockchain. When choosing a protocol, it may be essential to understand the throughput capacity and the anticipated user load of the intended application or solution.

Ecosystem adoption

Consider which protocol or platform other entities have adopted and look for any similarities between your company's project and theirs in terms of applications, solutions, volume, etc. This approach can help for two reasons. One, frequency of adoption can serve as a measure of the general trust that the market and users place in that protocol. Second, it may allow your company's intended application to integrate with other applications in the ecosystem thanks to the "composability" of blockchain applications (i.e., a protocol or platform is "composable" when its resources can serve as building blocks and/or be programmed into other applications).

Developer participation

Sustained developer activity on a protocol/platform is a generally good indicator of the health of a given ecosystem as well as gauge of future user adoption and technical advancements. Your company should evaluate the projects under development on the protocol, the teams building these projects, and the level of developer activity to analyze the developer mindshare that the protocol commands. (Mindshare means the level of awareness and usage of a protocol among software developers.) Large community support and mindshare often indicate that top technical talent sees merit in a protocol.

Integration readiness

Some protocols are more mature and equipped to integrate with legacy systems than others. That includes the ability to integrate with traditional financial rails such as credit cards/automated clearing house (ACH) networks, align with robust data analytics solutions, and support integration with communication channels such as email, text, etc. Your company should assess issues of integration readiness as it evaluates different protocols since blockchain solutions rarely stand in isolation from enterprise systems.

Conclusion

Despite all the challenges and decisions awaiting companies pursuing Web3 solutions and enterprise blockchain adoption, a recent poll[35] found that 87% of the surveyed businesses are likely to invest in a blockchain solution in the next 12 months. This finding could indicate a strong interest in the marketplace and a continued interest in and the relevance of blockchain for enterprises. And given the number of financial applications, the growing adoption of digital assets, and the maturing of existing enterprise blockchains, the time may be right for businesses to investigate, evaluate, and determine how they can experiment with blockchain to unlock their next cycle of growth and better reach and serve their consumers.

As explained, the transition to Web3 should not be a decision made in haste. Behind it lie numerous regulatory requirements, barriers to securing the right technical talent, ever-changing operating models, and many technical questions. And for the enterprise itself, there may be additional levels of attention required to evaluate accounting, controls, and tax considerations appropriately. It's important to understand what is possible today and to take advantage of specific use cases on the blockchain that can create new value and differentiate your business. It's time to consider exploring Web3 and uncover new competitive advantages while keeping the FUD (fear, uncertainty, and doubt) at bay.

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Endnotes

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At Deloitte, our people work globally with clients, regulators, and policymakers to understand how blockchain and digital assets are changing the face of business and government today. New ecosystems are developing blockchain-based infrastructure and solutions to create innovative business models and disrupt traditional ones. This is occurring in virtually every industry and in most jurisdictions globally. Our deep business acumen and global industry-leading Audit & Assurance, Consulting, Tax, and Risk & Financial Advisory services help organizations across industries achieve their various blockchain aspirations. Learn more at deloitte.com/us/blockchainanddigitalassets.

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