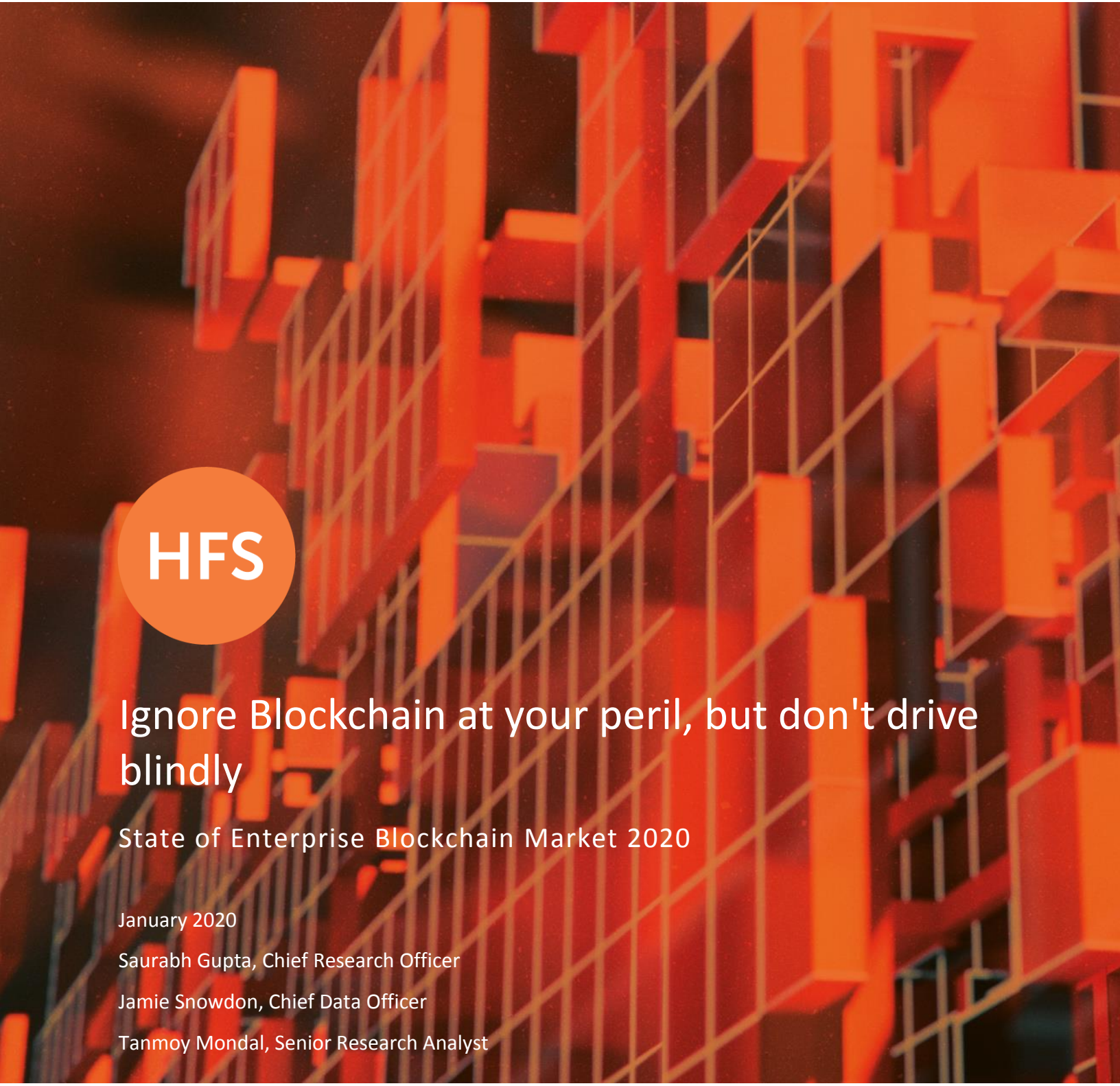

Ignore Blockchain at your peril, but don't drive blindly

State of Enterprise Blockchain Market 2020

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Defining Future Business Operations

Foreword

We are hurtling toward a hyperconnected economy, and blockchain promises to play a vital role in helping us get there.

Advancements in technology are pushing the boundaries of enterprise value creation. Organizational silos around the front, middle, and back offices are collapsing, creating boundaryless organizations where there is only “OneOffice” that matters—the office that caters to the customer. The Triple-A Trifecta (automation, artificial intelligence, and smart analytics) and the emergence of blockchain and the internet of things are helping organizations reach their OneOffice goals at a much faster pace.

HFS believes that as organizational silos converge, ecosystems will start to emerge. These networks will drive collaboration across multiple organizations with common objectives around driving completely new sources of value. Enterprises will need to be as hyperconnected and as autonomous as possible within their business environments if they want to pinpoint where disruption is coming from and where they can disrupt. Hyperconnected enterprises will succeed in reinventing themselves in an unforgiving world where we no longer have time to rest on our laurels. Emerging technologies, especially blockchain, are making this vision of a shared economy with distributed and trustworthy information a reality.

Wipro believes blockchain has the power to drive transformation across a range of industries through creating new business models, redistributing existing markets, and streamlining processes. Proper planning is the key success mantra to move blockchain projects from pilot to production. Organizations embarking on a blockchain journey need to look at three critical aspects in their blockchain programs. One, work use-cases backward. Executives must be sure that they need blockchain before they commit any budgets. Two, understand the multiplier effect. Real-life deployment of blockchain solutions will need to lay a strong foundation of multiple building blocks like security, internet of things, artificial intelligence, and the machine learning-based hybrid cloud, and they all need to be in place for the overall solution to succeed. Three, anticipate deep integration issues. Interoperability is the most important aspect to consider while adopting blockchain, and existing business processes and technical systems must be ready to bear this change. While it is common for enterprises to adopt new technologies quickly enough to stay competitive, this should not translate to rushing into pilots without scoping them out first.

We’ve had a few years to ruminate about the emergence and impact of blockchain—so where is the industry today, and what can we expect for 2020 and beyond? HFS partnered with Wipro to investigate. We are pleased to share the results and insights into the role that blockchain will play. We surveyed 318 senior executives (including 111 C-level executives) who are closely associated with their organizations' blockchain initiatives and reviewed 940 blockchain initiatives across the globe and industries.

This study provides unmatched insights into the current and emerging state of enterprise blockchain adoption. It explores why blockchain is emerging as a compelling value creation lever, what business problems it can or cannot address, and how enterprises should manage the adoption challenges.

Happy reading!

Phil Fersht, CEO and Founder, HFS Research

K. R. Sanjiv, CTO, Wipro

Executive summary

Distributed ledger technologies, including blockchain, promise to change business models fundamentally and are potentially as significant as the impact of the internet itself. Blockchain became a business buzzword in 2017 courtesy of the rise and fall of cryptocurrencies, during which we saw Bitcoin's value surge past $20,000 (albeit briefly!). In 2018, we began seeing blockchain proof of concept floodgates open as enterprises began to take it more seriously as a value creation lever. In 2019, we witnessed pioneering blockchain initiatives succeed and proceed from proofs of concept to pilots to "live, in-production," while several other efforts failed to move beyond laboratories. 2020 promises to be the most exciting blockchain year—we could see enterprise blockchain adoption come of age to solve real-world business problems.

With the objective of understanding the current and emerging state of enterprise blockchain adoption, HFS and Wipro surveyed 318 senior executives (including 111 C-level executives) who are closely associated with their organizations' blockchain initiatives and reviewed 940 blockchain initiatives across the globe and industries. We've also leveraged nine Wipro client case studies to bring the data and insights into life. Key findings of the study include:

- **Seventy-five percent (75%) of enterprises surveyed consider blockchain a strategic priority.** The blockchain "six-pack" (distributed shared data, consensus-driven trust, immutable transactions, data security, smart contracting, and permissioned and permissionless flavors) is driving tremendous interest among business and IT stakeholders wanting to create new sources of value.

- **Enterprise blockchain adoption is coming out of the closet.** While the financial services industry was an early mover, other industries are quickly catching up. More than 95% of enterprise blockchain initiatives focus on seven broad areas: identity (including digital wallets and know your customer technology), crypto and digital currencies, trade (including trade finance peer-to-peer trading, and commodity trading), payments, supply chain (including provenance, asset management, and logistics), fraud and compliance, and finance. The adoption of blockchain is nascent but ambitious. Only 14% of blockchain engagements have reached a production stage; however, the majority want to get there in the next two years.

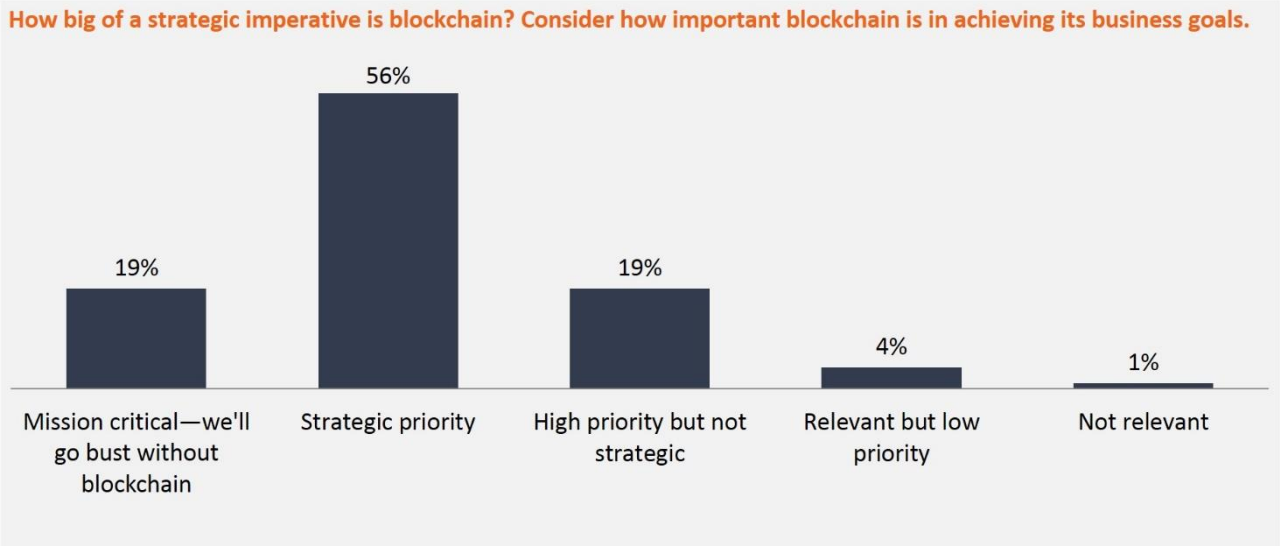
- **Enterprise blockchain is going through a 60-30-10 adoption challenge.** Around 60% of enterprises are still unclear about blockchain, highlighting the nascence of the concept. Nearly 30% of enterprises are struggling with how to get started, and the remaining few with successful proofs of concept or pilots are struggling to get to production. A balanced approach to blockchain is critical to driving meaningful success—you can no longer ignore blockchain as a value creation lever, but don't also get sucked into all the hype!

What you'll read

The blockchain “six-pack” is driving tremendous interest to create new sources of value

Seventy-five percent (75%) of respondents look at blockchain as a strategic priority (see Exhibit 1). Only 1% dismiss it as not relevant. The strategic priority of blockchain is even higher for C-level executives. Ninety percent (90%) of the surveyed C-level executives consider blockchain as a strategic priority compared to 69% of mid-senior management.

Exhibit 1: Blockchain is a strategic priority today



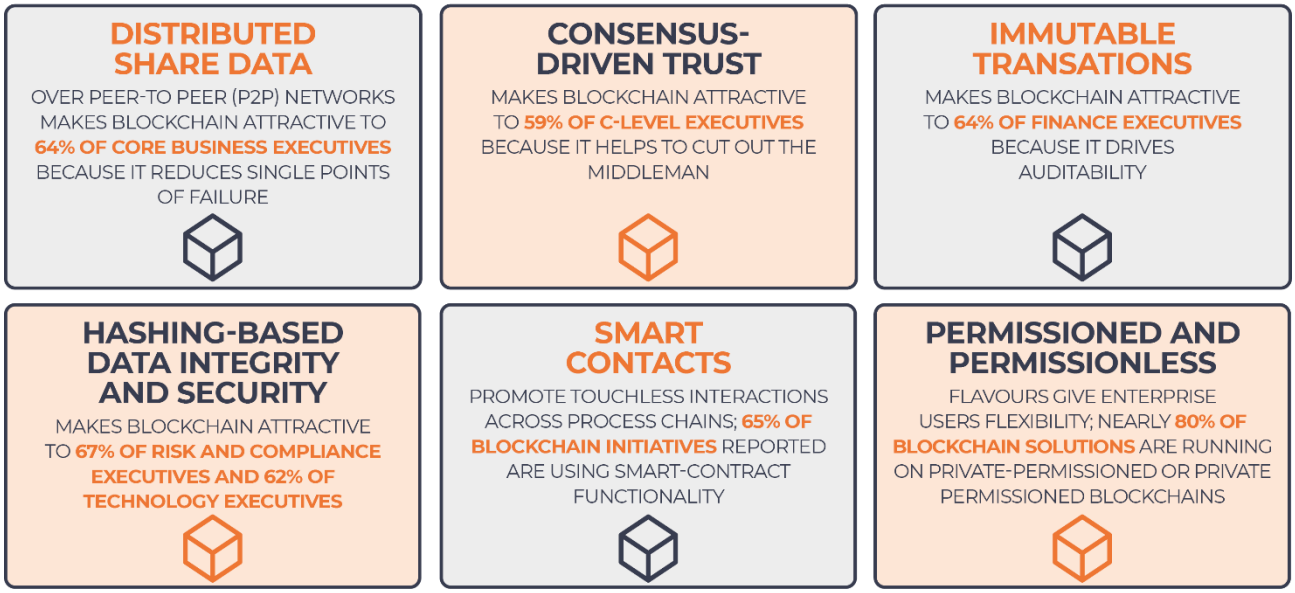
Sample: 318 senior executives (including 111 C-level executives) who are closely associated with their organizations' blockchain initiatives

Source: HFS Research, 2019

Six built-in features of blockchains manifest into a disruptive potential over the long run for enterprises when leveraged intelligently in relevant business use-cases. This “Blockchain Six-Pack” is changing the way we think about business transactions, data storage, and even industry value chains and associated revenue models (see Exhibit 2).

1. **Distributed shared data over peer-to-peer (P2P) networks reduces single points of failure.** The most fundamental difference between distributed ledger technologies (DLT) and the way we store data today is that distributed ledgers do not have a central administrator. A distributed ledger is replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, or institutions. This makes information available across the network in a fully transparent and autonomous way. Sixty-four percent (64%) of core business executives surveyed anticipate that blockchain can reduce single points of failure and enable far better collaboration.

EXHIBIT 2:
THE BLOCKCHAIN SIX-PACK



Sample: 318 senior executives (including 111 C-level executives) who are closely associated with their organizations' blockchain initiatives

Source: HFS Research, 2019

2. **Consensus-driven trust cuts out the middleman.** In blockchains, there is no need for a middle-man that you must trust. Trust is driven by consensus algorithms such as proof-of-work (PoW), proof-of-stake (PoS), proof-of-authority (PoA), Byzantine fault tolerance (BFT), and crash fault tolerant (CFT). As a result, you don't need to worry about unreliable, inaccurate, dishonest, or overpriced intermediaries. Nearly 60% of the C-level executives we surveyed believe that consensus-driven trust provides them with an opportunity to think and create entirely new business models that were not possible before blockchain.
3. **Immutable transactions drive auditability.** Each block in a blockchain contains a timestamp and a link to a previous block. By definition, blockchains are inherently resistant to modification of the data. Once recorded, the data in any given block cannot be altered retroactively without the alteration of all subsequent blocks and a collusion of the network majority creating a single source of truth, making it especially attractive to finance executives in search of an auditable trail.

4. **Hashing-based data ensures integrity and security.** All records on a blockchain are individually encrypted. Blockchains use cryptographic hash codes to verify data that drives up integrity and creates strong resilience to cyber-security concerns. More than 60% of technology, risk, and compliance executives find this inherent data integrity and security feature of blockchains especially attractive. However, while blockchain drives better security, data privacy is a potential concern, especially in public blockchain platforms. In a typical blockchain setup, all transactions are broadcast to all participants, and the details of interaction meant for two parties are visible to others as well, which can result in a breach of confidentiality requirements. However, emerging zero-knowledge proof (ZKP) techniques (see Case study 1) and off-chain data management are helping manage blockchain-related privacy concerns.

Case study 1. Using zero-knowledge proof to manage the menace of unsolicited telecommunications

Zero-knowledge proof (ZKP) is a technique by which a prover can convince the verifier of a fact without revealing the actual content; for instance, proving one's age without sharing their date of birth. Wipro built a blockchain solution that leverages ZKP to manage the menace of unsolicited commercial communication (text messages and voice calls). Telecom regulatory bodies have now mandated that this kind of communication should be filtered based on subscriber's preferences and consent. Exposing this data would result in the subscriber being subjected to more spam, targeted advertising, etc. The telecom service provider (TSP) needs to provide evidence that messages are segregated based on subscriber's preferences so that a level playing field is maintained. Wipro's ZKP solution enables the TSP to construct a proof that can be used by the verifier (auditor) to validate the proof of delivery or exclusion.

5. **Automated smart contracts promote touchless interactions across process chains.** Several blockchains also offer smart contract functionality. These are computer protocols that facilitate, verify, or enforce the negotiation or performance of a contract, or that prevent the need for a contractual clause. This allows contracts to auto-execute based on pre-set conditions or triggers and allows for much higher levels of straight-through processing (see Case study 2). It can even allow millions of internet of things (IoT) devices to work autonomously. Nearly 65% of the 940 blockchain projects that we reviewed as a part of this research are using smart contract functionality.

Case study 2. The smart contract-based renewable energy platform

A Europe-based oil and gas company is leveraging blockchain to be a market maker for renewable energy trading and empower end users (prosumers) to sell directly, in a peer-to-peer fashion, excess (non-consumed) energy to consumers. It partnered with Wipro to create a smart contract-based renewable energy trading platform. The solution allows for the recognition, tokenization, and exchange of prosumer generated energy on a peer-to-peer blockchain network. Individual tariff plans are maintained, and smart contracts exercise the change of ownership and payments for the energy transactions. Blockchain is enabling this oil and gas company to diversify into a renewables future and contribute toward reducing the overall carbon footprint.

6. **Permissioned and permissionless flavors give enterprise users flexibility.** Much like public and private clouds, blockchains can be private (permissioned), public (permissionless), or somewhere in between (hybrid). These flavors give enterprises the flexibility to choose a solution based on their needs and preferences. Permissioned blockchains enhance privacy and take less computational power (so have higher throughput) but lack the utopian trust that permissionless blockchains, such as Bitcoin, can bring. Much like the early days of cloud, 80% of the current solutions are running on private-permissioned or private-permissionless blockchains, though we expect more hybrid (private-public) blockchains to emerge as confidence in these solutions increases (again, similar to the cloud adoption).

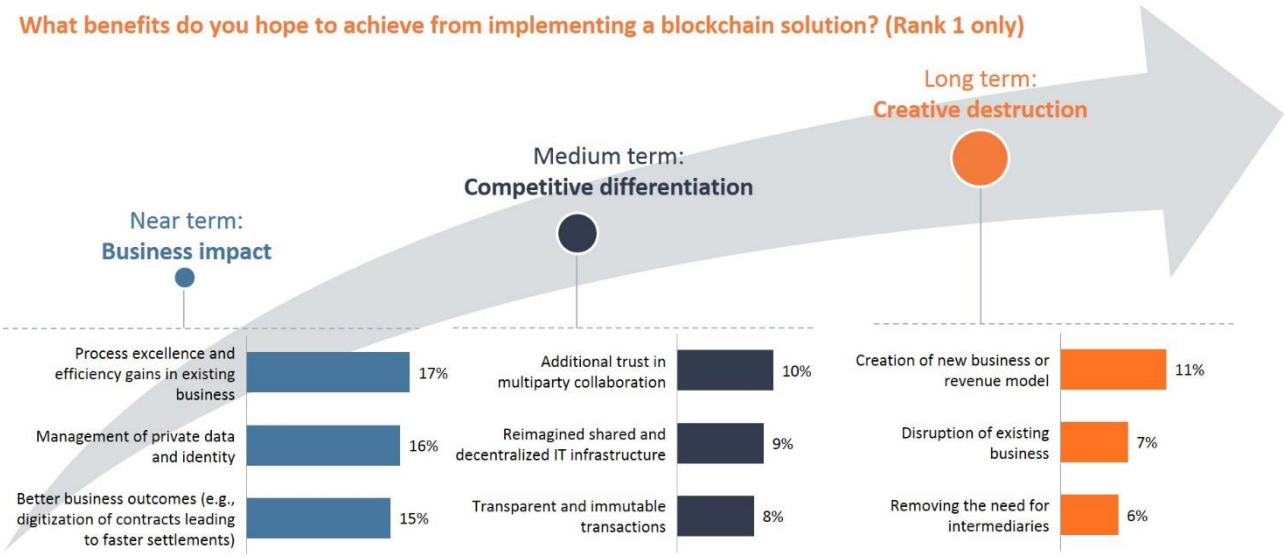
Real blockchain clients want real business impact

Blockchain promises "creative destruction" through disintermediation, but that is a long-term vision. Only 6% of executives we surveyed are leveraging blockchain to remove the need for intermediaries (see Exhibit 3). Enterprise blockchain clients are investing in blockchain solutions to get real business impact. Without a tangible ROI, blockchain engagements get stuck at the proof of concept (PoC) or pilot stage. No-nonsense, real business cases are a must-have to drive blockchain beyond the PoC-fatigue that we are witnessing today. Consequently, the current focus for enterprise adoption is business optimization with a tangible ROI (see Case study 3).

Case study 3. Driving a tangible ROI using blockchain by creating a "just-in-time" automotive supply chain

Inbound logistics in the automotive sector accounts for 10% of manufacturing costs. Incoming flows to automotive manufacturers are mostly delivered just in time (JIT). This amounts to 40% of the average parts volume of a car. Everyday manufacturing flow interruptions caused by problems in the supply chain management affects the overall productivity due to micro-stops and macro-stops, accounting for 2% to 4% of overall equipment effectiveness (OEE). Wipro partnered with a logistics provider to create a just-in-time or zero-inventory for the entire automotive supply chain. The solution is built on a private permissioned blockchain network comprising the logistics partner, automotive OEM, carriers, suppliers, and payment partners. Blockchain ledger recorded and traced the movement of shipments with related details along with the tread of its inbound logistics to provide near real-time visibility of shipment status across the network.

Exhibit 3. The blockchain value proposition for enterprises



Sample: 318 senior executives (including 111 C-level executives) who are closely associated with their organizations' blockchain initiatives

Source: HFS Research, 2019

More than 75% of respondents are leveraging blockchain for near-term business impact (process excellence and efficiency, data and identity management, and better business outcomes) or to drive competitive differentiation (reimagined IT infrastructure, additional trust in multi-party collaboration, transparent and immutable transactions). Twenty-five percent (25%) of respondents are pursuing the utopian promise of blockchain (creating new business models, disrupting existing business, and removing intermediaries).

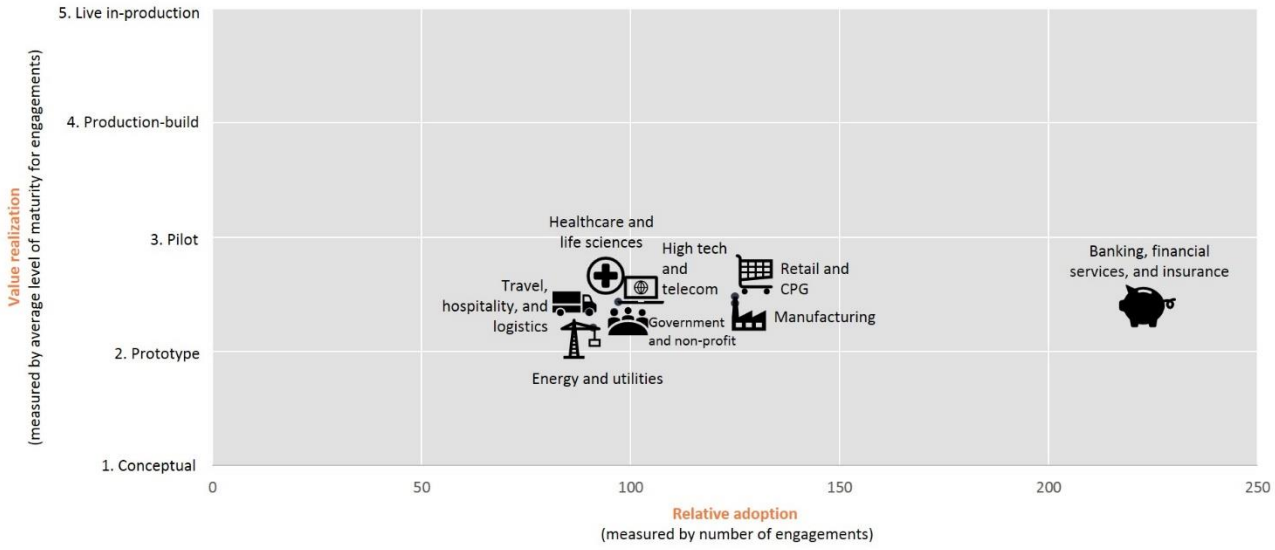
Enterprise blockchain adoption is coming out of the closet

Enterprise blockchain has broader implications than just for financial services. There is no doubt that financial services were the first movers from an enterprise blockchain adoption perspective. Blockchain use cases around payments (see Case study 4), trade finance, know your customer (KYC), and digital wallets were the first to emerge. However, other industries are realizing the power of blockchain and starting to gain traction (see Exhibit 4). For industries with globally distributed and complex supply chains (e.g., retail, consumer products, manufacturing, and logistics), blockchain promises unprecedented solutions to almost unsolvable issues around transparency, traceability, and trust (see Case study 5). Blockchain also promises to solve ownership recording issues in the public sector as well as health records management for healthcare. The combination of IoT with blockchain is opening new doors for value creation in industries like insurance. Travel and hospitality firms are looking at blockchain to redefine loyalty management for their clients and improve overall customer experience (see case studies 6 and 7). Energy and utilities firms are looking at blockchain for peer-to-peer energy trading (see case studies 2 and 8), smart grids, and carbon accounting. The possibilities seem endless!

Case study 4. Wholesale interbank payments settlement using central bank digital currency (CBDC) for an Asian central bank

Recent pilot projects at central banks in Canada, Singapore, and Hong Kong have shown that a decentralized real-time gross settlement (RTGS) system using wholesale central bank digital currency (CBDC) with liquidity saving mechanisms is possible and that cross-border CBDC payment with DLT would be the next step. An Asian Central Bank partnered with Wipro to understand the implications of decentralized RTGS and automated liquidity saving mechanisms using wholesale CBDC on payment operations, banks' business models, and local and global compliance. The results of the blockchain proof of concept involved the creation of a blockchain consortium with the top eight banks and the central bank of the country were impressive. It drove settlement finality in seconds compared to days, secure transactions with public-private cryptography and multiparty authorization, lean technology and infrastructure, and reduction in the cost of processing.

Exhibit 4. Enterprise blockchain adoption by industries



Sample: 940 blockchain projects across the globe

Source: HFS Research 2019

Case study 5. Blockchain in pharmaceutical supply chains

The cold-chain currently represents 19% of all pharmaceutical logistics. The volume of medicines that require refrigerated storage and distribution is expected to grow 70% over the next six years. Today, 20% of drugs go to waste due to broken cold chains. A leading pharmaceutical company partnered with Wipro to create a blockchain and IoT-based industry platform to track and capture information on the movement of finished drug products across the supply chain from production sites, distribution centers, and logistics partners. The solution includes tracking the drug packages using IoT sensor readings across the different entities, recording the data in a shared DLT ledger as an immutable record shared by multiple entities to monitor and report any anomalies across the supply chain. Currently, the sensors measure temperature, humidity, geographic location, and tampering. This will help reduce wastage occurring due to temperature excursions in transit of drugs and help save costs for the pharma major.

Case study 6. Blockchain for air travel baggage tracking

The airport industry is on crossroads for enhancing the passenger experience. This is evident in the 2018 IATA Global Passenger Survey, where more than 50% of travelers identified baggage tracking throughout their journey as a primary challenge and wanted real-time information on the baggage delivery status. This has led to IATA to issue Resolution 753, which encourages airports and airlines to enable cross-party sharing of baggage information between airports, airlines, and baggage handlers. Wipro is collaborating with a large airport authority to develop a smart baggage tracking solution built on blockchain for enhanced and robust tracking of the baggage across the globe. It involves building a consortia network of airports, airlines, and third-party service providers and enabling real-time sharing of information through a single shared source of truth. This will lead to better travel experience for passengers, increased non-travel revenue for airports, and a positive brand impact for airports and airlines.

Case study 7. Digital currency for airline industry for a travel-services company

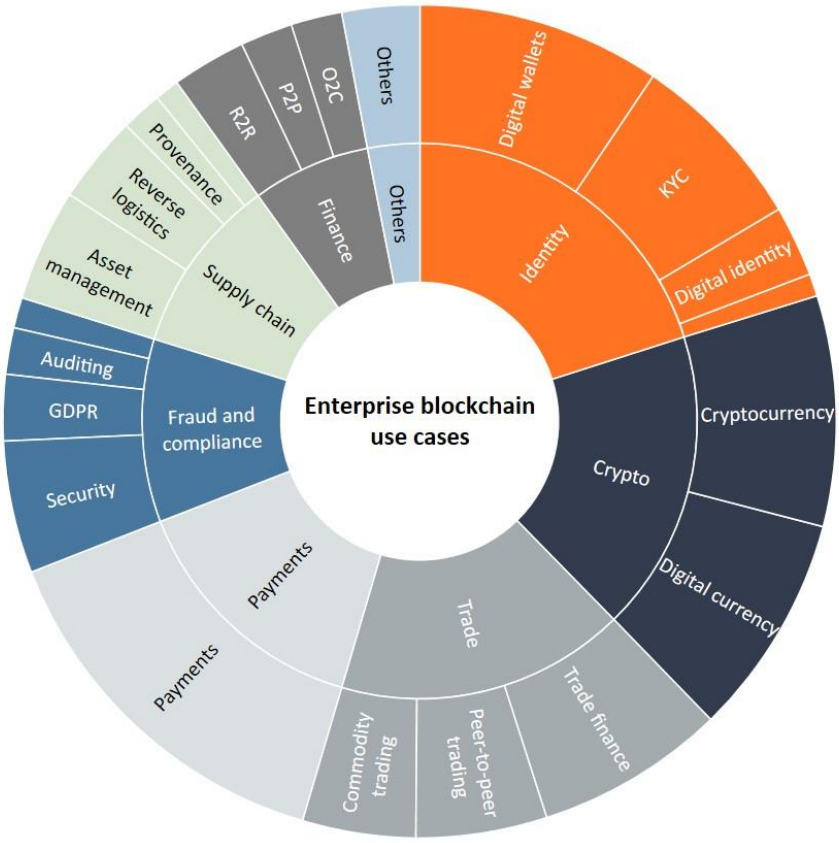
Nearly 4.5% of all flights are canceled. The refund amounts paid by airlines have increased to over £700 million in 2017 compared to less than £1 million pre-2010. The delays in compensation and refunds also lead to bad customer experience. The travel services company wanted to develop a payment system that would enable the airlines to refund and compensate the passengers with a blockchain-based coin, incentivizing those passengers to reinvest their windfall with the original issuing airline and facilitating payments to other retailers in the community. The solution assumed that a certain proportion of passengers would "recycle" their windfall back to the issuing airlines. The solution built by Wipro allows the issuing airline to receive a share of the commission on third party retail spends by passengers. The potential business benefits of the solution include millions in revenues saved by reduced fares, new revenue streams for other airline services, and improved customer experience.

Case study 8. Small-scale LNG trade platform for a Europe-based leading energy company

A large oil and gas company wanted to enter new markets in the small-scale facilitation of LNG, which had a disparate number of players, a large number of transactions, and high operational costs. Wipro collaborated with the client to reimagine the trade ecosystem by creating a unique marketplace of LNG commodity trading in Europe focused on bringing in operational efficiencies, reducing costs of the physical commodity trades, and reducing manual interventions by bringing automation. It involved building a consortium for all major buyers and sellers to act a common trading marketplace platform and for trading in a peer-to-peer fashion. Smart contracts were built for order and supply placement, delivery of the goods, validating the state of goods, and completing the cycle with the bill settlements. The logistical chain of events was maintained in the blockchain for real-time tracking of shipments with immutable audit trail and regulatory compliance.

However, In the mad rush to find blockchain use cases, practical blockchain use cases are getting lost among the nonsensical ones. Blockchain is not the panacea for everything, and we need to choose the use cases carefully. Our assessment of the 940 blockchain engagements suggests that more than 95% of enterprise blockchain initiatives focus on seven broad areas: identity, crypto, trade, payments, fraud and compliance, supply chain, and finance (see Exhibit 5).

Exhibit 5. Enterprise blockchain use-cases

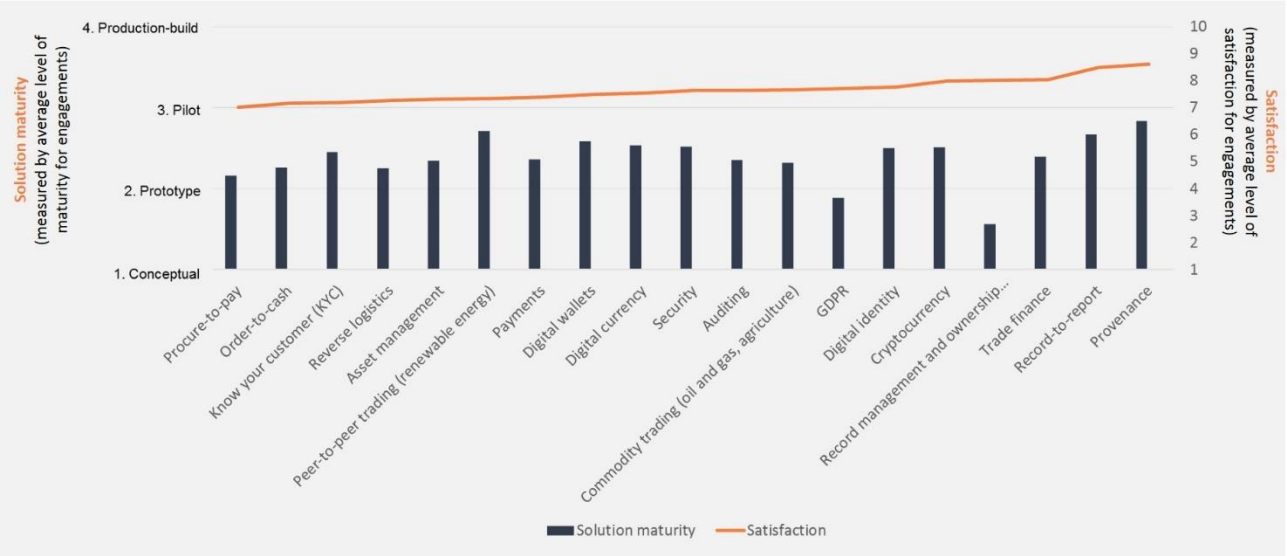


Sample: 940 blockchain projects across the globe

Source: HFS Research, 2019

The average maturity of blockchain initiatives is still low, between POC and pilot for most. But clients are mostly satisfied with the outcomes thus far. The average satisfaction score of 7+ on a 10-point scale is not spectacular, but it's not bad for a nascent technology. It's also interesting to note that while blockchain-enabled payments was among the first use cases identified, satisfaction with it is mediocre compared to relatively new use cases, such as supply chain provenance, which report the highest level of satisfaction in our research (see Exhibit 6).

Exhibit 6. Maturity and satisfaction with enterprise blockchain initiatives



Sample: 940 blockchain projects across the globe (excluding use-cases with less than ten responses)

Source: HFS Research, 2019

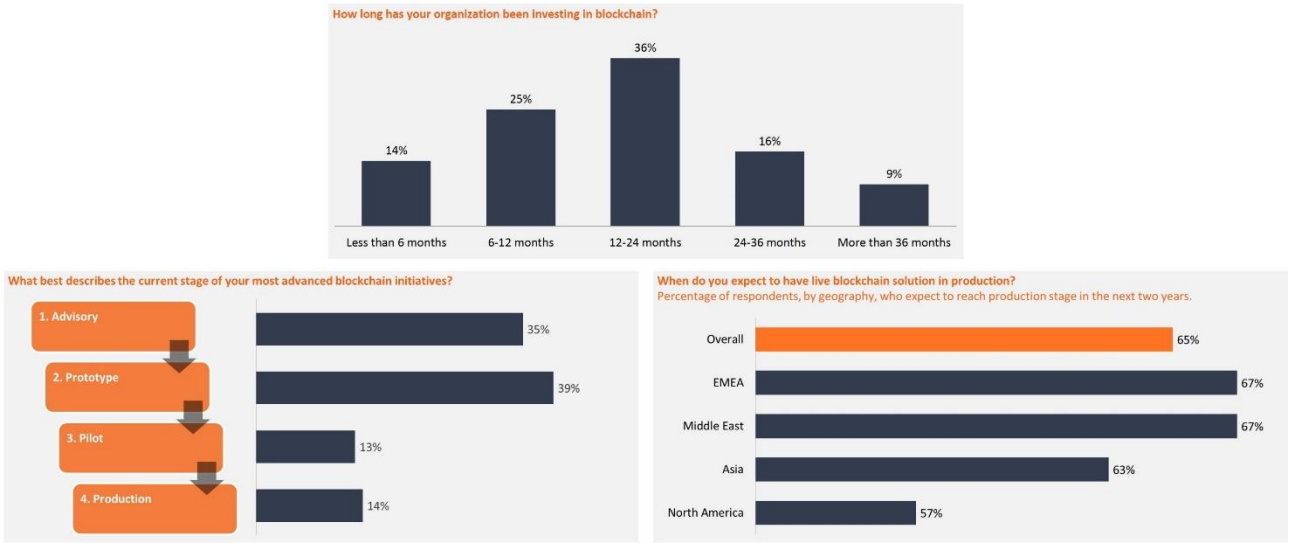
Enterprise adoption of blockchain is nascent and challenging but ambitious

Enterprise blockchain adoption is experiencing an explosion in PoCs and pilots, but in-production solutions are few and far between (see Exhibit 7). Almost all live, in-production engagements are parallel or shadow environments where legacy environments have not been completely replaced. But this is not entirely surprising, as most organizations are still at an investigative stage. Seventy-five percent (75%) of initiatives are less than two years old, and over 85% of enterprises have budgeted less than $20 million toward blockchain initiatives. However, a majority of the enterprises are pushing to get there in the next two years. Respondents outside of North America are even more bullish about blockchain (see Case study 9)!

Case study 9. Car rental contract management using blockchain for Middle Eastern automobile company

Customer service and experience are critical in rental car management. Inefficiencies in contracts and lack of transparency in the renting process can affect customer satisfaction and impact the rental company's business. An automobile company in the Middle East partnered with Wipro to create a blockchain solution that can solve the inefficiency in contract management by enhancing transparency, bringing real-time visibility, and introducing process integrity through business rules embedded in smart contracts. The objective of this project was to show the capability of blockchain in the used car rental process, such as with car booking, car pick up, fines and charges accrued during rentals, and car return, for increasing transparency and efficiency.

Exhibit 7. Enterprise blockchain adoption trends



Sample: 318 senior executives (including 111 C-level executives) who are closely associated with their organizations' blockchain initiatives

Source: HFS Research, 2019

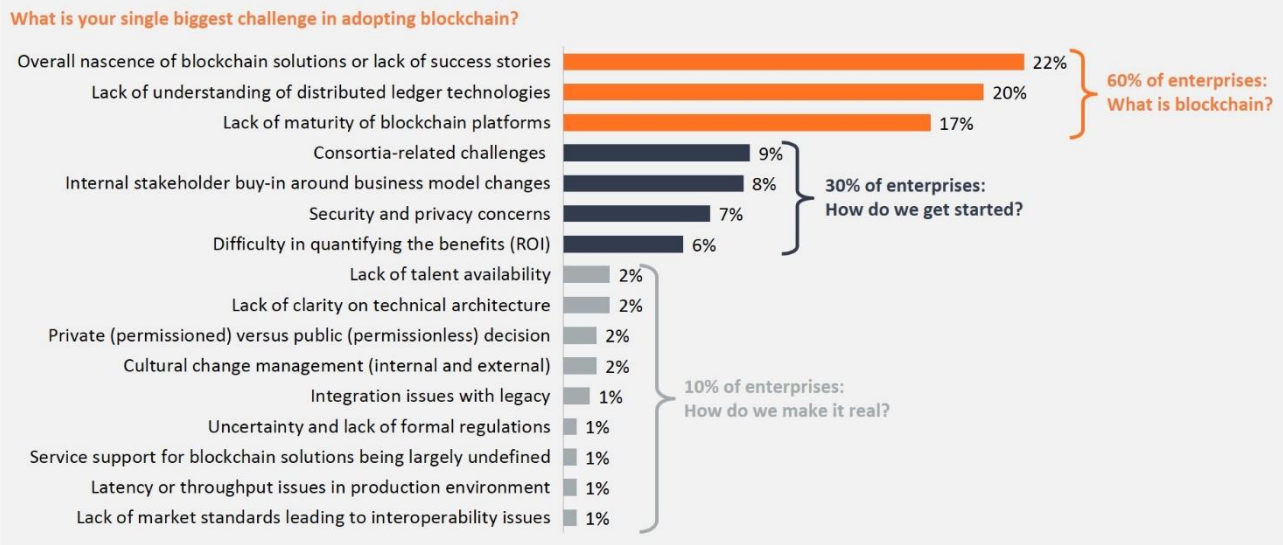
There are three major hurdles on the blockchain adoption journey. Enterprise blockchain adoption is going through a 60-30-10 adoption challenge! (See Exhibit 8.)

- **Hurdle #1. What is blockchain?** Over 60% of enterprises are still unclear about blockchain, highlighting the nascence of the concept. Most enterprises are trying to internalize the concept of blockchain and its relevant impact on their business. Also, the recent market excitement around cryptocurrencies is encouraging many enterprise leaders to look more closely at blockchain. Given the overall nascence of blockchain solutions, enterprises lack the understanding of distributed ledger technologies and their use cases. The lack of success stories in the market also makes internal stakeholder buy-in challenging. Internal stakeholders are almost always associating blockchain with the threat of disruption, and they want to stay away from it, not embrace it.
- **Hurdle #2. How do we get started?** Nearly 30% of enterprises that identified relevant use cases are struggling to determine the starting point for their PoCs and pilots. Without a crisp use case, it becomes hard to quantify the benefits (ROI) and to develop a total cost of ownership (TCO) model. Lack of maturity of the blockchain platforms and the multitude of frameworks (such as Ethereum, Hyperledger Fabric, R3 Corda, Ripple, Quorum, and Multichain) create a lack of clarity on the required technical architecture. Much like the private versus public cloud debate, there is a tough decision around permissioned or permissionless blockchain as well as the associated security and privacy concerns. Also, given many blockchain use cases revolve around transforming a value-chain involving multiple organizations and stakeholders, consortia come with their own set of challenges around setting-up, decision rights, and ongoing management and governance. Also, most enterprises are being side-tracked by experimenting with the emerging use of AI, automation technologies, and the added headache of figuring out blockchain places a strain on already stretched IT departments. However, the broad potential

of blockchain in a genuinely impactful digital business context is already driving some organizations to place blockchain at the front of the innovation queue.

- **Hurdle #3. How do we make it real?** The few (less than 10%) that do have successful pilots are challenged with scalability to a production-grade environment. There is a looming blockchain POC fatigue, as nearly 40% of initiatives in our research are stuck at the prototyping stage and struggling to get to production. There are uncertainty and a lack of formal regulations, as well as no market standards leading to interoperability issues. Most blockchains also are still trying to work through the latency or throughput issues in a production enterprise environment. Blockchain talent is hard to find, and last, but not the least, integration with legacy technologies and service support for blockchain solutions remains mostly undefined.

Exhibit 8. The 60-30-10 enterprise blockchain adoption challenge



Sample: 318 senior executives (including 111 C-level executives) who are closely associated with their organizations' blockchain initiatives

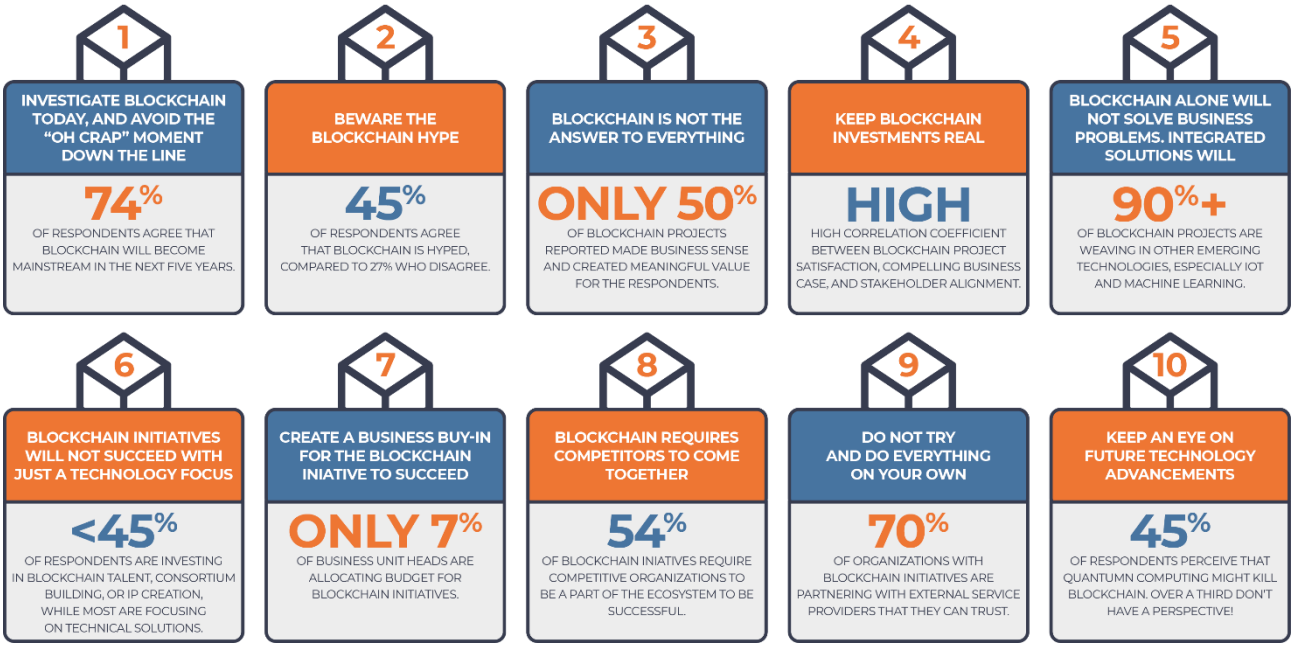
Source: HFS Research, 2019

The Bottom Line: Ignore blockchain at your peril, but don't drive blindly. Here are our 10 recommendations to drive meaningful success from blockchain.

We are hurtling toward a hyperconnected economy, and blockchain will provide the way to make it happen. Ecosystems across organizations that service the specific needs of a customer are emerging. No single organization owns the entire customer experience, and competitors and peers need to figure out how to collaborate. Blockchain, in combination with other emerging technologies like IoT and artificial intelligence (AI), will provide a way to make it happen. But blockchain also runs the risk of becoming representative of the massive hype bubble we live in today: yet another technology hammer trying to find

business problems to nail. Here are the top 10 recommendations to drive meaningful success from blockchain initiatives (see Exhibit 9).

EXHIBIT 9:
TOP 10 HFS RECOMMENDATIONS TO DRIVE MEANINGFUL SUCCESS FROM BLOCKCHAIN INITIATIVES



Sample: 318 senior executives (including 111 C-level executives) who are closely associated with their organizations' blockchain initiatives and 940 blockchain engagements across the globe and industries

Source: HFS Research, 2019

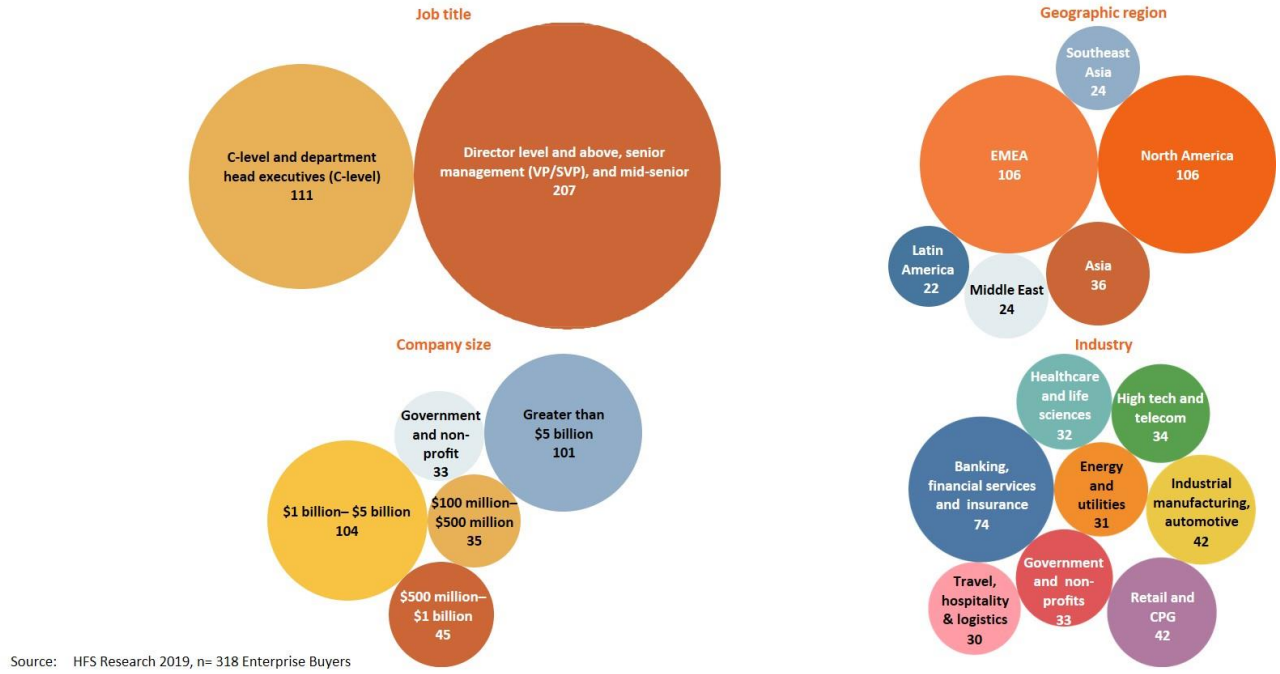
1. **Investigate blockchain today and avoid the "oh crap" moment down the line.** Nearly 75% of respondents agree that blockchain will become mainstream in the next five years. So don't sit back and assume that the world is not changing. If you are hanging out with the 60% (refer to Exhibit 8), avoid the "Oh crap! I wish…" moment and go ahead and investigate blockchain, because very soon this funnel is going to flip!
2. **Beware the blockchain hype.** Forty-five percent (45%) of respondents agree that blockchain is hyped, compared to 27% who disagree. Despite the cryptocurrency bubble-burst in 2018, blockchain continues to be one of the most hyped emerging technologies. It's becoming harder to see through the blockchain hype these days to examine the problems we're trying to solve, create solutions for, and contextualize in real-world scenarios.
3. **Blockchain is not the answer to everything.** Among the hype and mad use cases, there is some gold, but it's getting lost in the noise. Blockchain is not the panacea for everything, and we need to choose the use cases carefully. Only around half of the 940 blockchain projects reported are the ones that make business sense and created real value for respondents.

4. **Keep blockchain investments real.** The correlation coefficient[1] between blockchain project satisfaction and compelling business case, stakeholder alignment, and desired outcome is high (0.7-0.8). We might not see the true disruptive potential (disintermediation) of blockchains until the adoption of blockchains becomes more real and widespread for value propositions that create a tangible business impact in the near term.
5. **Blockchain alone will not solve business problems. Integrated solutions will.** More than 90% of blockchain projects are weaving in other emerging technologies, especially the IoT and machine learning. IoT initiatives are starting to use blockchain to alleviate scalability, privacy, and reliability concerns. Artificial intelligence and blockchain technologies are also intersecting as the sources of this data become more diverse, and data-sensitivity, governance, quality, and integrity become even more important.
6. **Blockchain initiatives will not succeed with just a technology focus.** While most respondents are focusing on technical solutions, less than 45% of respondents are investing in blockchain talent, consortia, research, and intellectual property. A blockchain narrative purely centered on technology is a recipe for failure—people (stakeholder buy-in, change management, skills development) and processes (business case, governance, scaling, and service support) are equally essential to drive success.
7. **Create a business buy-in for the blockchain initiative to succeed.** Seventy-five percent (75%) of respondents look at blockchain as a strategic priority today, but the budget for more than 90% of blockchain initiatives is emanating from IT budgets. Only 7% of business unit heads are allocating budget for blockchain initiatives, which leads us to question their overall commitment. Blockchain success requires strong business-IT collaboration. Blockchain is not just a new tool but a new way of doing things. Without the organization coming together and truly collaborating, chances of success are dim.
8. **Blockchain requires competitors to come together.** Blockchain is the only emerging technology that needs to be deployed across organizations to make an impact. Fifty-four percent (54%) of blockchain initiatives require competitive organizations to be a part of the ecosystem to be successful. There is a multitude of challenges that the market needs to overcome (lack of awareness, solution immaturity, and lack of standards and regulations, among others), but one of the biggest hurdles is to get organizations (that often directly compete with each other) to come together. Until organizations are convinced of the value proposition of the hyperconnected world and a sharing economy, blockchain will struggle to realize the value potential it promises.
9. **Do not try and do everything on your own.** Seventy percent (70%) of organizations with blockchain initiatives are partnering with external service providers that they can trust across advisory, POC, pilot, and production stages of their blockchain initiatives. In these early stages of adoption, finding friends that can learn from each other and work through the challenges is extremely important.
10. **Keep an eye on future technology advancements.** Forty-five percent (45%) perceive that quantum computing might kill blockchain. Over a third don't know! Do you know the answer? Or are you at least trying to find it?

[1] The correlation coefficient is a statistical measure that calculates the strength of the relationship between the relative movements of two variables. The values range between -1.0 and 1.0. A correlation of -1.0 shows a perfect negative correlation, while a correlation of 1.0 shows a perfect positive correlation.

Appendix—Study methodology and demographics

HFS and Wipro surveyed 318 senior executives (including 111 C-level executives) who are closely associated with their organizations' blockchain initiatives. We reviewed 940 blockchain initiatives across the globe and industries. We've also leveraged nine Wipro client case studies to bring the survey data and insights into life.



Source: HFS Research 2019, n= 318 Enterprise Buyers

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Saurabh Gupta oversees HFS' global research function managing the team of analysts across US, Europe, and Asia-Pacific. He sets the strategic research focus and agenda for HFS Research, understanding the needs of the industry, and ensuring that HFS remains a thought leader for operations and services research.

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About Wipro

Wipro Limited (NYSE: WIT, BSE: 507685, NSE: WIPRO) is a leading global information technology, consulting and business process services company. We harness the power of cognitive computing, hyper-automation, robotics, cloud, analytics and emerging technologies to help our clients adapt to the digital world and make them successful. A company recognized globally for its comprehensive portfolio of services, strong commitment to sustainability and good corporate citizenship, we have over 175,000 dedicated employees serving clients across six continents. Together, we discover ideas and connect the dots to build a better and a bold new future.

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The HFS mission is to provide visionary insight into major innovations impacting business operations, including: automation, artificial intelligence, blockchain, Internet of things, digital business models, and smart analytics.

HFS defines and visualizes the future of business operations across key industries with our Digital OneOffice™ Framework.

HFS influences the strategies of enterprise customers to help them develop OneOffice backbones to be competitive and to partner with capable services providers, technology suppliers, and third-party advisors.

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