



HfS Blueprint Report: **Enterprise Blockchain Services**

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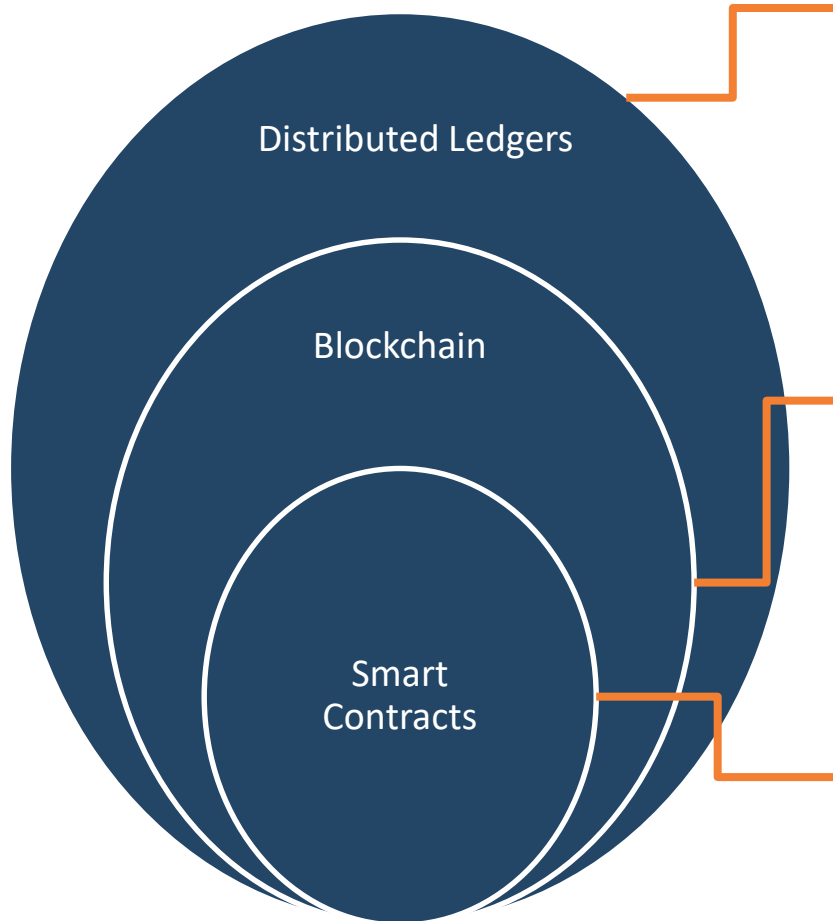
Introduction to the 2017 HfS Blueprint Report: Blockchain Services

- Distributed ledger technologies, including blockchain, promises to fundamentally change and disrupt business models, potentially as significantly as the internet itself.
- HfS recognizes blockchain as a Horizon 3 change agent for digital operations – with significant value potential but still nascent for mainstream adoption.
- The 2017 Enterprise Blockchain Services Blueprint investigates the blockchain space to provide a comprehensive and foundational analysis of the blockchain solutions and services market for enterprises.
- The report defines the blockchain ecosystem and analyzes the relative adoption of blockchain services across all industries and use cases.
- It focuses on blockchain capabilities of 21 service providers. The report also covers market trends, value proposition and challenges, and predictions for enterprise blockchain services.
- Unlike other quadrants and matrices, the HfS Blueprint identifies relevant differentials between services providers across a number of facets in two main categories, innovation and execution.

Definitional Frameworks



Distributed ledgers, blockchain, and smart contracts are interrelated, but different



A **distributed ledger** is replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, or institutions.

Distributed Ledgers do not have a central administrator. They are based on peer-to-peer networks with a consensus algorithms

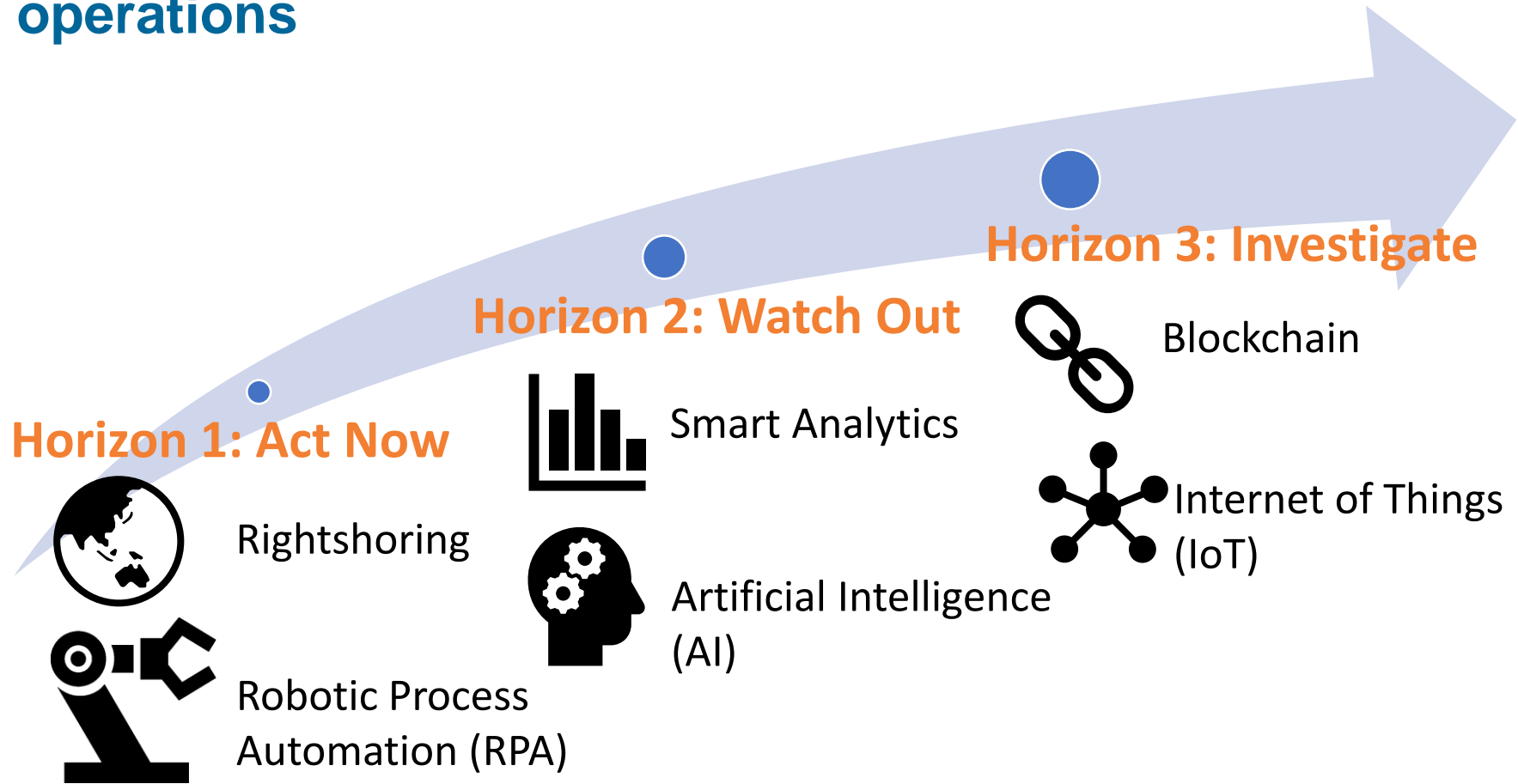
Blockchain is a distributed ledger used to maintain a continuously growing list of records, called blocks. Each block contains a timestamp and a link to a previous block. By definition, blockchains are inherently resistant to modification of the data. Once recorded, the data in any given block cannot be altered retroactively without the alteration of all subsequent blocks and a collusion of the network majority.

All blockchains are distributed ledgers, but not vice versa

Smart contracts are computer protocols that facilitate, verify, or enforce the negotiation or performance of a contract, or that obviate the need for a contractual clause.

Not all blockchain frameworks support smart contracts

Blockchain is a Horizon 3 Change Agent for digital operations



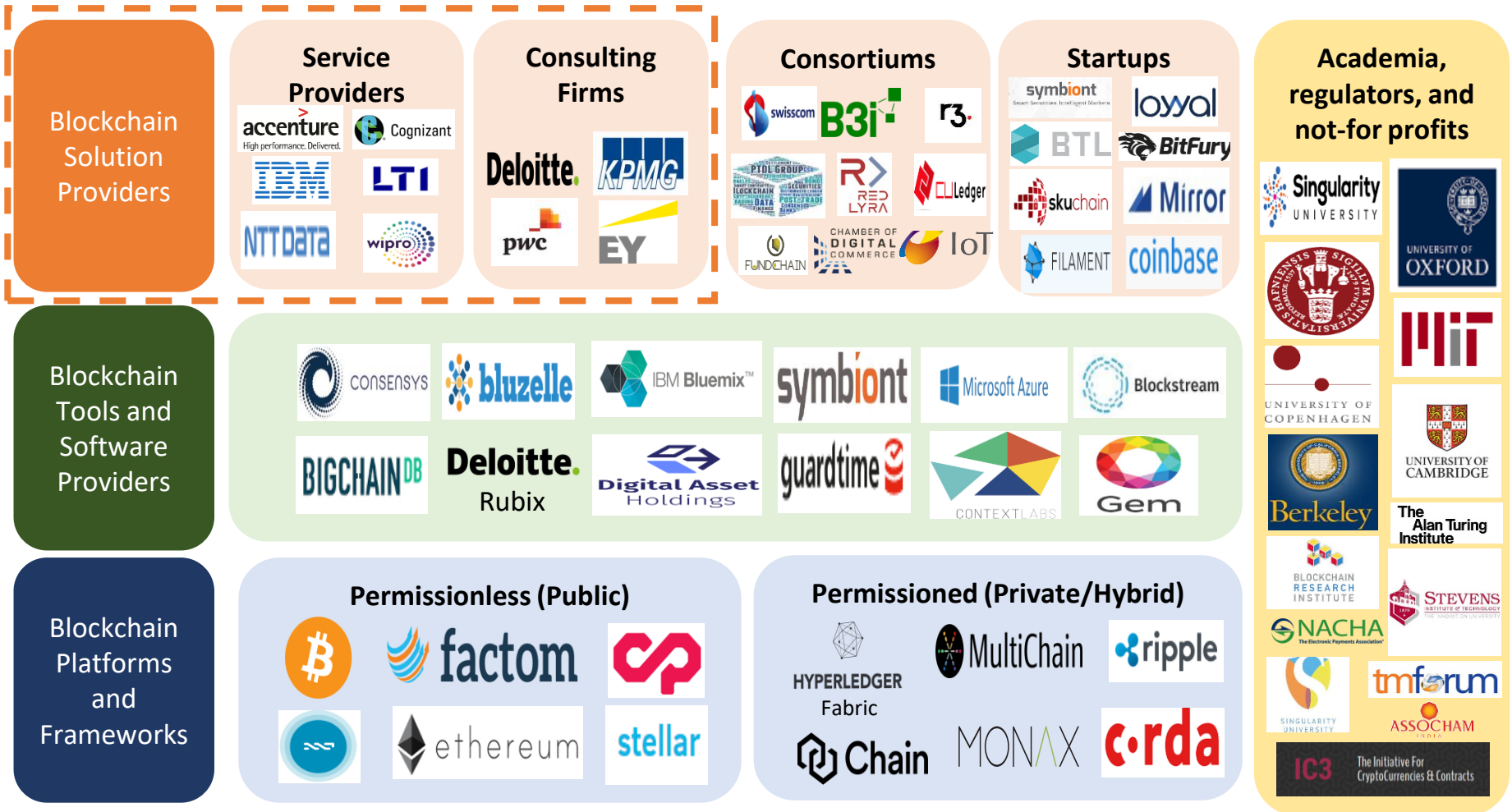
Success in the future will be determined by how well clients and service providers are able to combine the power of multiple change agents into integrated solutions that solve crucial business problems

The blockchain ecosystem has multiple sets of players; this report focuses on blockchain service providers and consulting firms

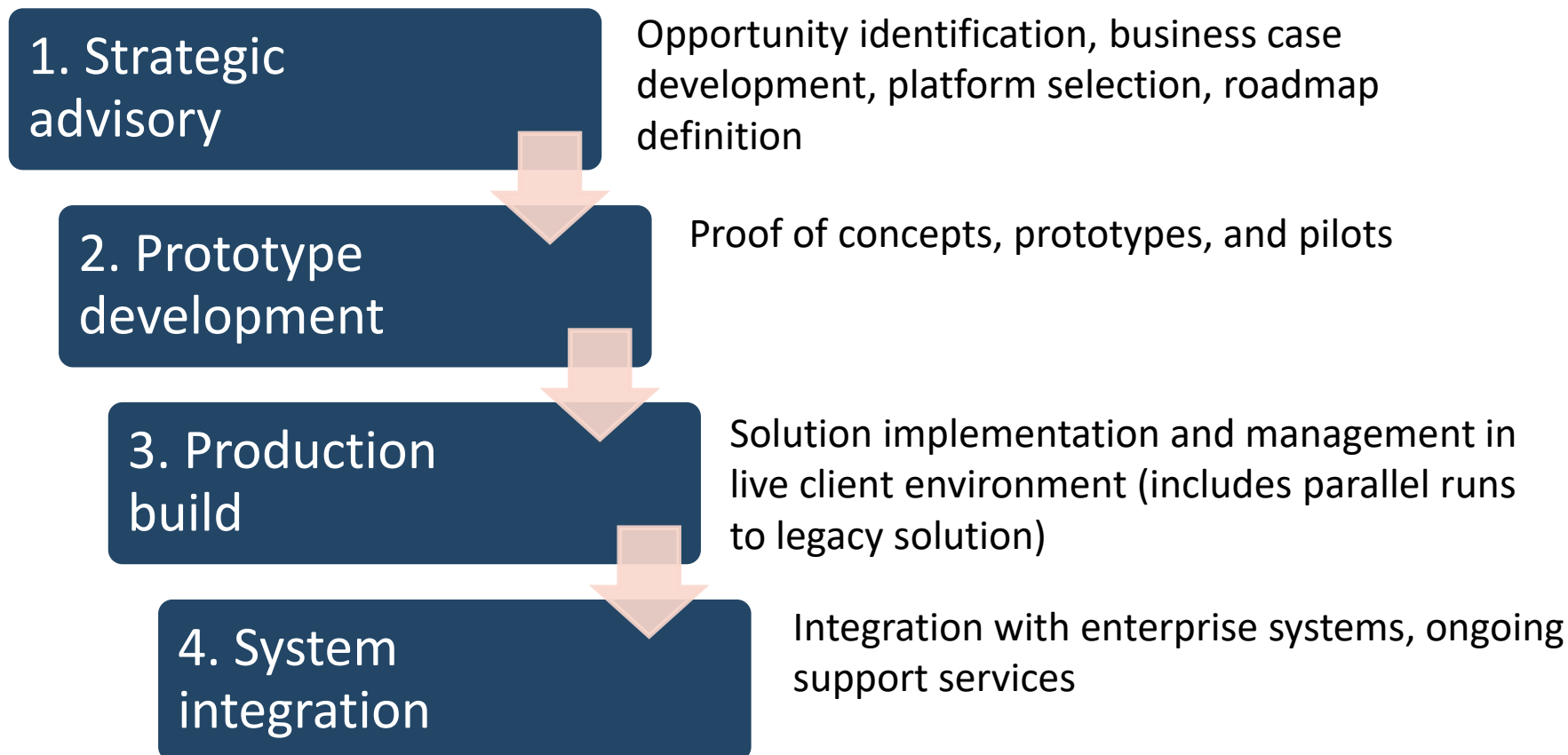
Blockchain provider ecosystem

Illustrative, not comprehensive

Scope of this report



The end-to-end blockchain services value chain for enterprise use cases has four distinct stages



Executive Summary



Executive Summary

(page 1 of 2)

- **Enterprise blockchain services are geared to become a US \$1 billion market by 2018.** The current revenues from enterprise blockchain services are relatively small (US \$500 million - \$600 million), but we expect to see a proliferation in enterprise blockchain services with anticipated YoY growth in excess of 100% over the next 12-24 months.
- **Blockchain services will create a disruptive impact, potentially as significant as the internet itself, in the long run.** Blockchain has the potential to drive new business models and disrupt existing ones by removing the need for intermediaries. However, HfS expects a five to seven year horizon for blockchain to fully deliver given the nascency of the technology and associated challenges. In the meantime, we do expect blockchain initiatives to drive significant efficiency gains in existing business models as well re-imagined transactional management and IT infrastructure that could be a source of competitive advantage.
- **The market is witnessing an explosion in blockchain PoCs and pilots, but in-production solutions are few and far between.** Our analysis suggests that 90% to 95% of the enterprise blockchain initiatives are at the strategy formulation, PoC, or pilot stage. Only 5% to 10% successful pilots progress to production. Almost all live in-production engagements are parallel or shadow environments where legacy environments have not been completely replaced. As blockchain solutions become production ready, there is a strong market for system integration across blockchains and existing legacy and ERP technology.
- **Blockchain (like any nascent technology) is going through the “90-9-1” adoption challenges.** Ninety percent of enterprises are still trying to internalize the concept of blockchain and its relevant impact on their business. Nine percent of enterprises that identified relevant use cases are struggling to determine the starting point for their PoCs and pilots. And the 1% of enterprises that have successful pilots are challenged with scalability to a production-grade environment. Lack of formal regulations, talent availability, and market standards combined with technical inter-operability and throughput issues are the key challenges that the blockchain market is trying to solve for.

Executive Summary

(page 2 of 2)

- **Adoption of blockchain is a global phenomenon.** Unlike most other new technologies, the more developed western economies are not dominating blockchain adoption. We have witnessed a large number of interesting use cases in Japan, Australia, Nordics, China and South East Asia, and Middle-East beyond North America and Western Europe.
- **Ethereum and Hyperledger Fabric are emerging as the blockchain frameworks of choice for enterprise blockchain initiatives.** Ethereum accounts for nearly half of the enterprise use cases and represents the most mature with a proven smart contract framework and use cases across industries. Adoption of Hyperledger Fabric is expected to pick-up after the recent release of the production-ready version given that it is designed for enterprises. R3 Corda, Ripple, Quorum, Multichain, BigChainDB, and Chain are other notable blockchain frameworks used in nearly 45% of the enterprise use cases.
- **Blockchain initiatives are starting to get woven with other emerging technologies, especially IoT and AI.** IoT initiatives are starting to use blockchain to alleviate scalability, privacy, and reliability concerns. AI 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.
- **Financial services lead blockchain adoption; however, credible use cases across almost all industries are emerging.** Several financial services use cases such as payments, trade finance, and wallets are fairly advanced in terms of adoption. Insurance, professional services, manufacturing, retail, public sector, energy and utilities, and healthcare are other industries where a number of interesting blockchain use cases are emerging. Our analysis indicates significant traction in identity management, provenance management, claims and payment processing, and ownership recording.
- **Service provider landscape.** We assessed 21 service providers across multiple dimensions on blockchain innovation and innovation. The HfS Winner's Circle for the 2017 Enterprise Blockchain Services is comprised of Accenture, Deloitte, EY, IBM, KPMG, and Wipro.

State of the Enterprise Blockchain Services Market



The enterprise blockchain services market is relatively small (US \$500 to \$600 million) but has an expected annual growth in excess of 100% and immense long-term potential

Enterprise revenues from blockchain services = US \$500 to \$600 million¹ with 100%+ YoY growth

1. HfS estimates based on 2017 headcount assessment of 20+ leading blockchain services suppliers

- The current revenues from enterprise blockchain services are relatively small (US \$500 to \$600 million¹), largely driven by strategic advisory and prototype building
- We expect to see a proliferation in enterprise blockchain services with anticipated YoY growth in excess of 100% over the next 12-24 months

- Adoption across industries beyond banking is increasing and will result in a far greater number of enterprises testing the waters through pilots and PoCs.
- Existing pilots and PoCs will start to scale up into production environments, though we expect most clients to take a risk-averse approach of running blockchain solutions in parallel with legacy solutions until the technologies mature further.
- Revenues from system integration services will emerge as more clients become production ready.

- Crypto-currency market cap has increased from US \$16 to \$180 billion in less than a year

- The market cap for cryptocurrencies was \$16 billion at the start of 2017. It rose spectacularly to \$110 billion by June 2017, fell to less than \$70 billion by mid-July, then rose to more than \$170 billion in October 2017.
- The cryptocurrency market cap is not directly related to enterprise blockchain revenues, but does indicate the strong interest and potential of blockchain-based solutions.
- The volatility, however, continues to be a concern. Read more on the topic [here](#).

Crypto-currency market cap reaches nearly US \$180 billion²

2. Coinmarketcap.com as of Oct 30, 2017

The inherent features of blockchain manifests into a disruptive potential over the long run

Near-term: Business impact

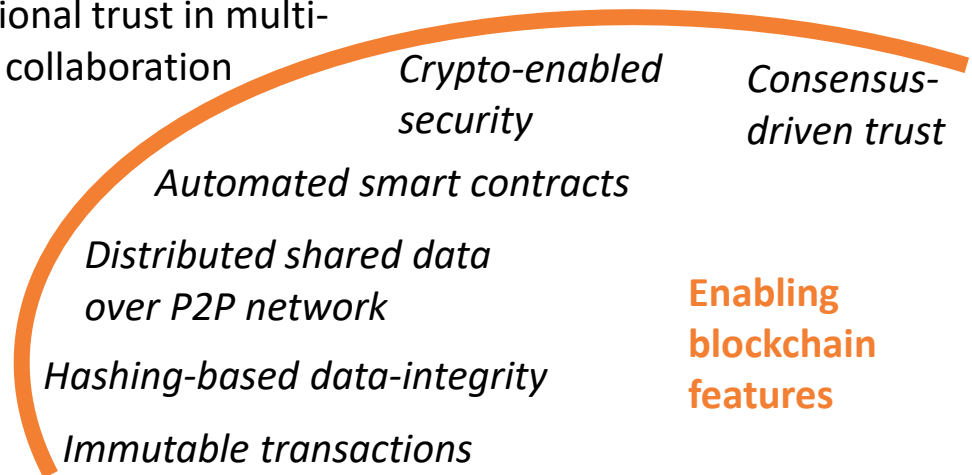
- Process excellence and efficiency gains in existing business models
- Traceability through provenance and asset tracking
- Digitization of contracts leading to faster settlements
- Management of private data and digital identity

Medium-term: Competitive differentiation

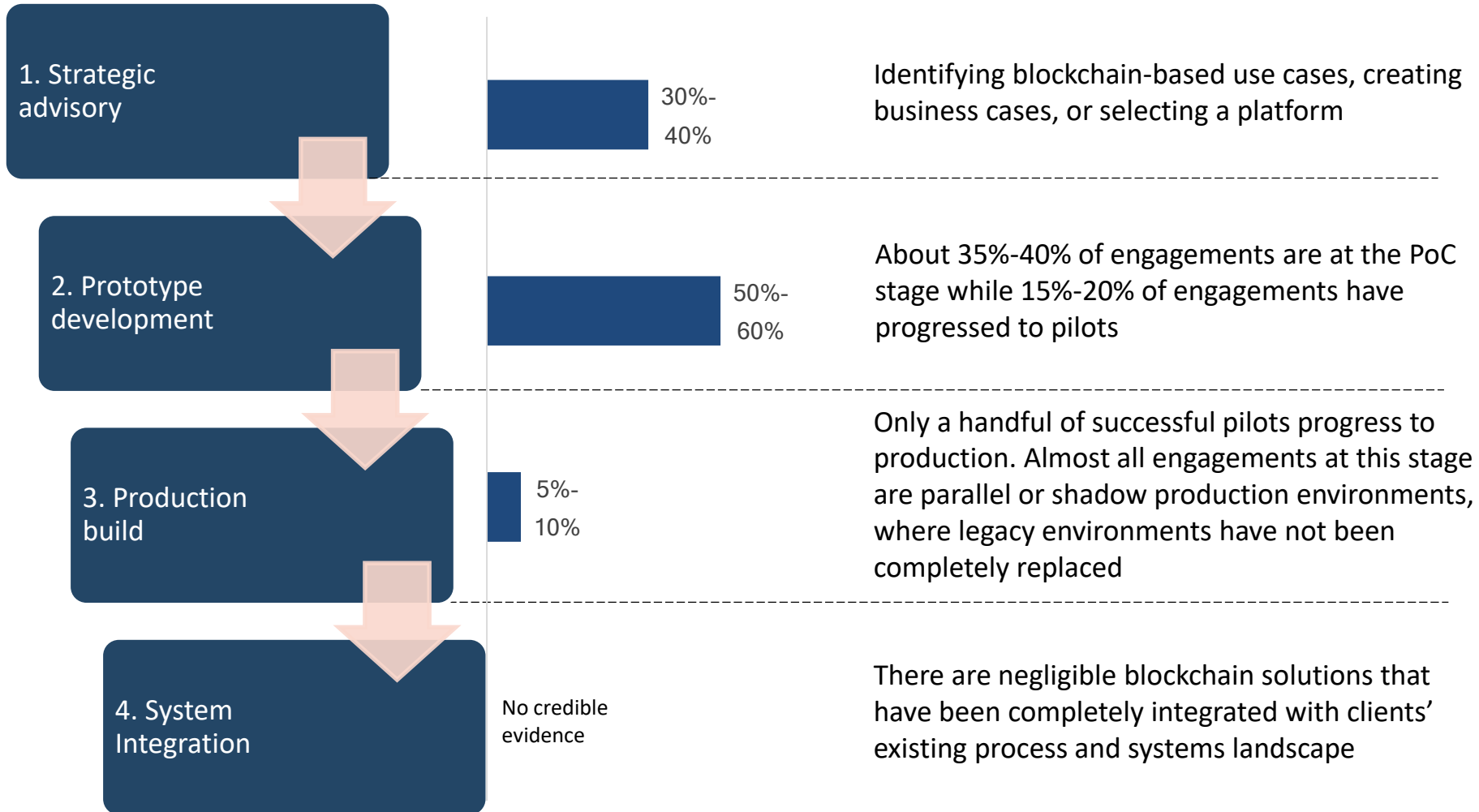
- Re-imagined IT infrastructure that is shared and decentralized
- Re-defined transaction management that is transparent and immutable
- Additional trust in multi-party collaboration

Long-term: Creative destruction

- Creation of new business models
- Removing the need for trusted intermediaries
- Disruption of traditional businesses



The market is witnessing an explosion in blockchain PoCs and pilots but in-production solution are few and far between

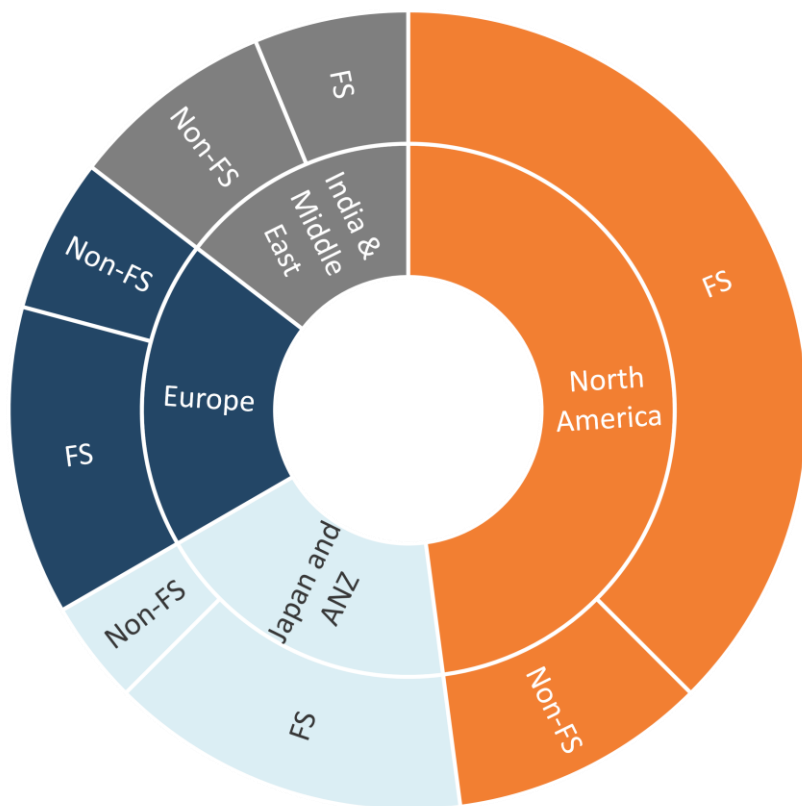


N = ~200 blockchain engagements across 20 service providers

Adoption of blockchain is a global phenomenon

Adoption of Enterprise Blockchain Services by Geography

Relative number of blockchain initiatives



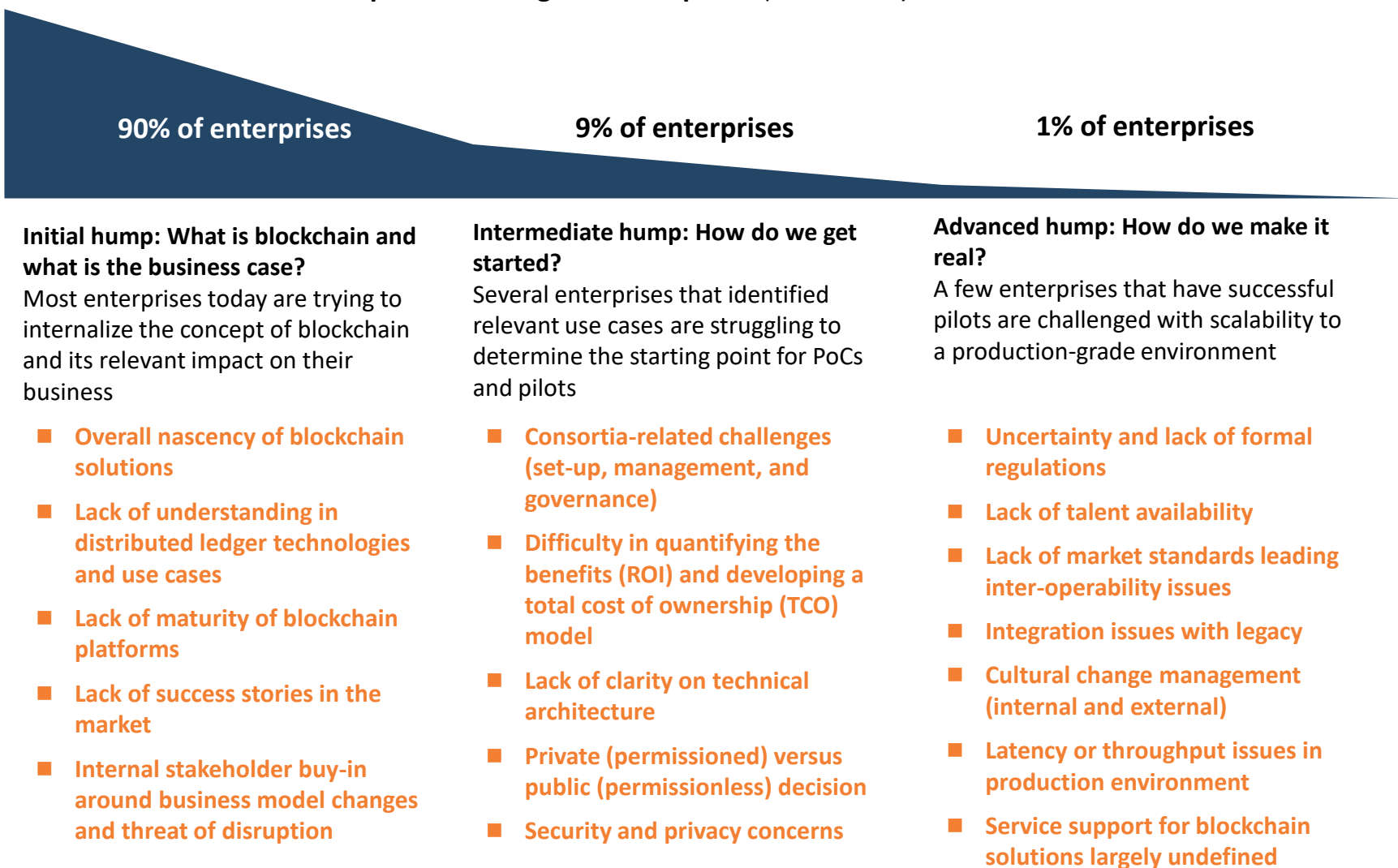
N = ~50 blockchain engagements

FS = Financial Services

- Unlike most other new technologies, the more developed western economies are not dominating blockchain adoption
- We have witnessed a large number of interesting use cases in Japan, Australia, Nordics, China and South East Asia, and the Middle East beyond North America, and Western Europe
- Across geographies, blockchain adoption started with financial services but is now expanding to other industries as well as the public sector

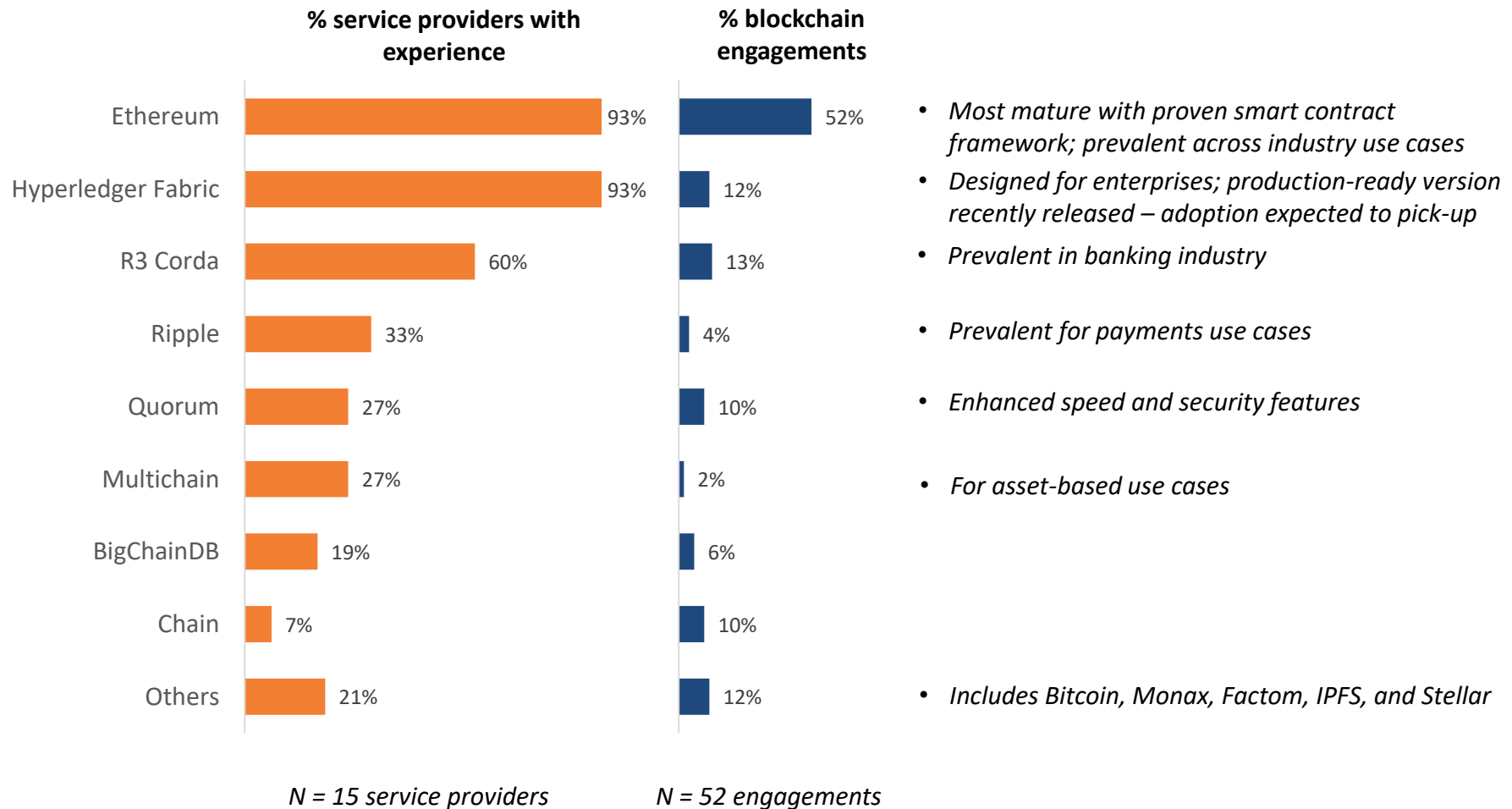
Blockchain (like any nascent technology) is going through the “90-9-1” adoption challenges

The “90-9-1” Blockchain Adoption Challenge for Enterprises (*Illustrative*)

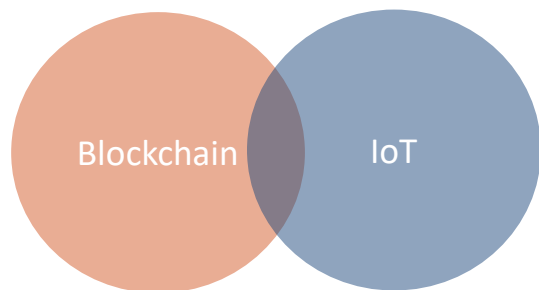


Ethereum accounts for nearly half of the enterprise use cases.

Adoption of Hyperledger Fabric is expected to pick-up

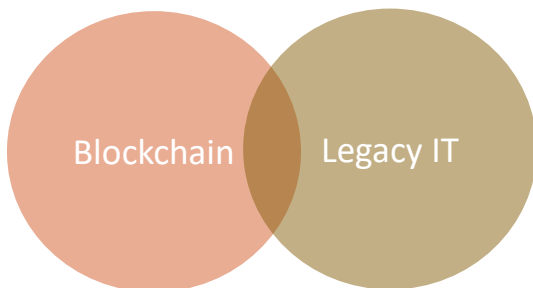
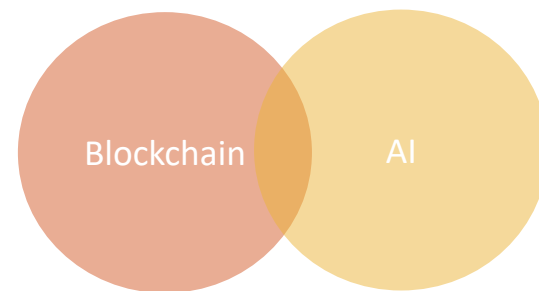


Blockchain initiatives are starting to get woven with other emerging technologies especially IoT and AI



- Identity and security are major issues in the IoT space today and centralized solutions for both are not proving to be adequate
- IoT can make use of blockchain to alleviate scalability, privacy, and reliability concerns.
- Since the blockchain is tamper-proof, customers will see a reduced risk of their personal data being leaked via a security breach
- Blockchain can be used in tracking billions of connected devices, enable the processing of transactions and coordination between devices

-
- AI and blockchain technologies will intersect as the sources of this data become more diverse and more sensitive, governance, quality, and integrity become even more important
 - There is a latent need for sophisticated AI-driven analytics as blockchain adoption increases and more complex and critical data is stored in distributed ledgers



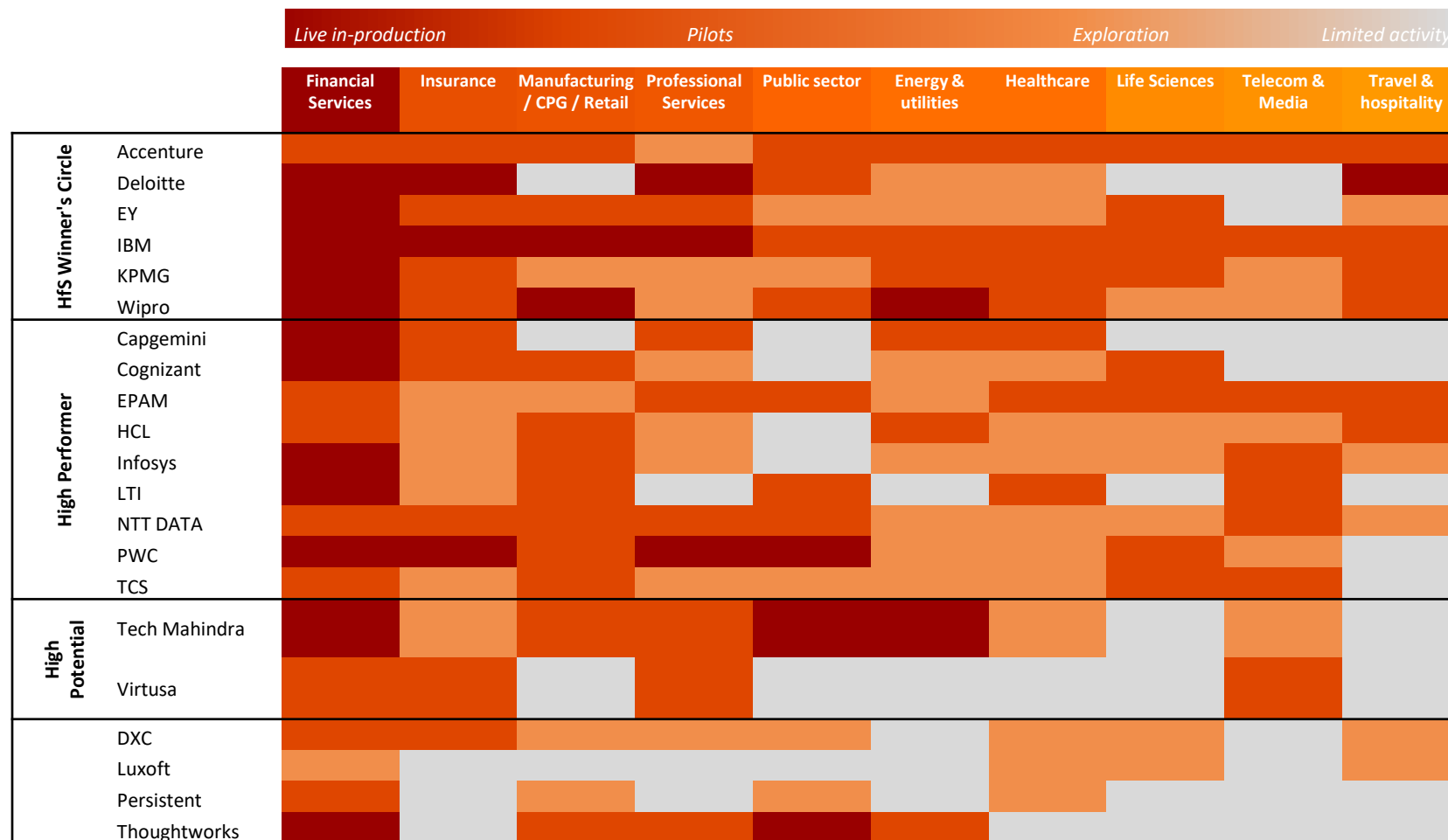
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- As blockchain solutions become production-ready, there is a strong market for system integration across blockchains and existing legacy and ERP technology
 - Service providers are already starting to build a variety of integration tools and methodologies to support this

Service provider landscape

- We assessed 21 service providers across multiple dimensions on blockchain innovation and innovation
- **HfS Winner's Circle** represents service providers who excel at both execution and innovation dimensions. The HfS Winner's Circle for blockchain services include:
 - Accenture
 - Deloitte
 - EY
 - IBM
 - KPMG
 - Wipro
- The **High Performers** all execute well and are investing in future capabilities, but need to gain more consistency and traction with clients for impact. The blockchain services High Performers are:
 - Capgemini
 - Cognizant
 - EPAM
 - HCL
 - Infosys
 - LTI
 - NTT DATA
 - PwC
 - TCS
- **Tech Mahindra** and **Virtusa** emerged as **High Potentials**, with strong commitment to the blockchain market but yet to gain the traction relative to High Performers or HfS Winner's Circle.
- **DXC, Luxoft, Persistent, and ThoughtWorks** also participated in our study, and we see these companies making traction in execution and innovation, just a little further behind than their peers.

Financial services lead blockchain adoption; however, credible use cases across almost all industries are emerging

Blockchain industry adoption heatmap across 20+ service providers



**Professional services industry coverage includes auditing, accounting, legal, real-estate, etc.

Several financial services use cases such as payments, trade finance, and wallets are fairly advanced in terms of adoption

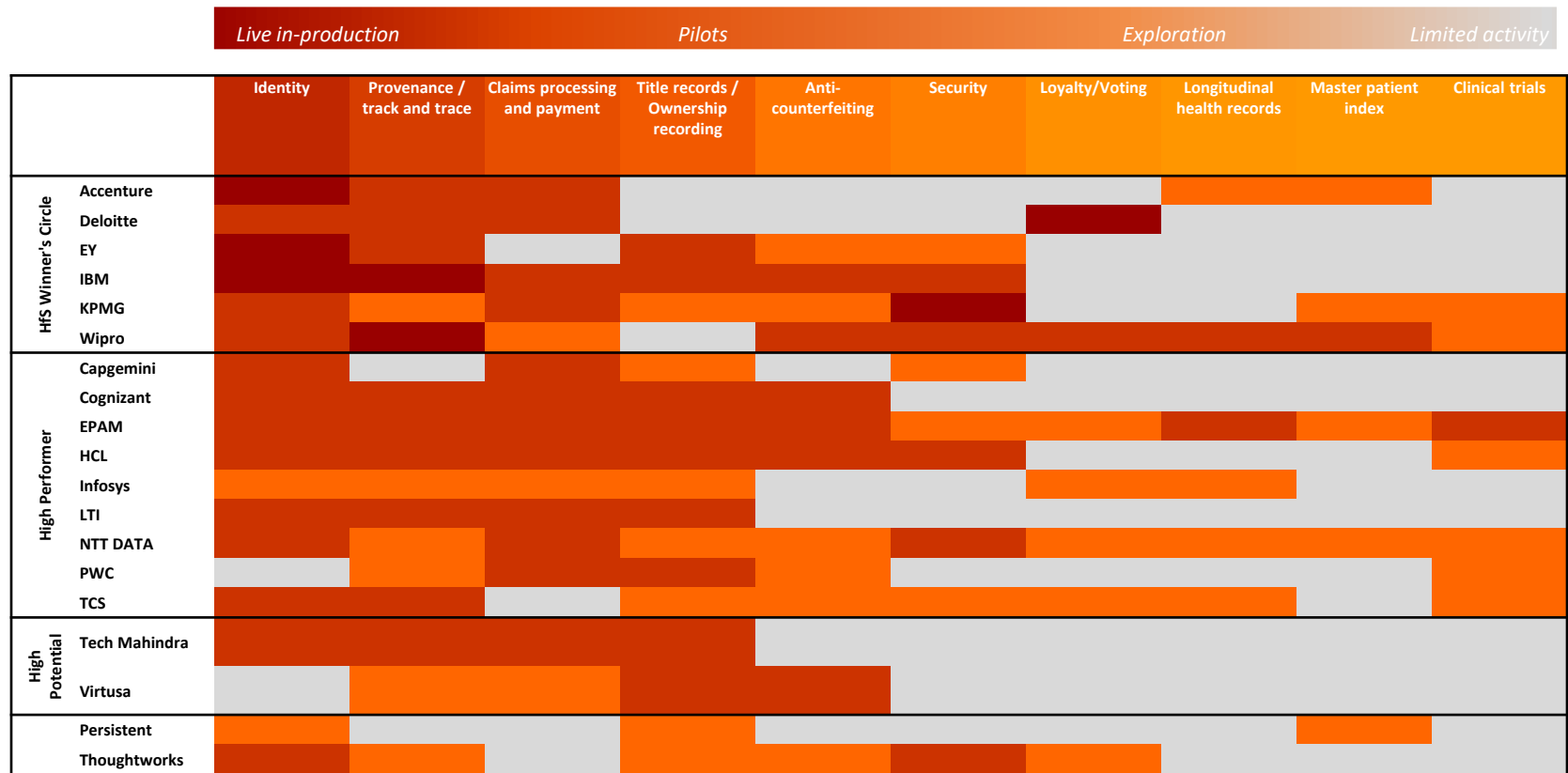
Blockchain use-case heatmap in financial services



This is not an exhaustive list of financial services blockchain use cases but a list of most frequently reported use cases across the 20+ service providers covered in the report

Blockchain is also gaining significant traction in identity management, provenance management, claims and payment processing, and ownership recording

Blockchain use-case heatmap across industries (excluding financial services)



This is not an exhaustive list of non financial services blockchain use cases but a list of most frequently reported use cases across the 20+ service providers covered in the report

Research Methodology



Research Methodology

Data Summary

Data was collected via RFIs, interviews, briefings, and publicly available information sources Q3 2017. Sources include: clients, providers, and advisors and influencers of blockchain services.

Participating Service Providers



This Report is Based On:

- **Tales from the Trenches:** Interviews with buyers who have evaluated service providers and experienced their services. Some contacts were provided by service providers, and others were interviews conducted with HfS Executive Council members and participants in our extensive market research.
- **Sell-Side Executive Briefings:** Structured discussions with service providers regarding their vision, strategy, capability, and examples of innovation and execution.
- **Publicly Available Information:** Thought leadership, investor analyst materials, website information, presentations given by senior executives, industry events, etc.

HfS Blueprint Scoring: Enterprise Blockchain Services





Execution 100%		Innovation 100%	
Market commitment	20%	Articulation of value proposition	20%
<ul style="list-style-type: none"> Dedicated blockchain practice Years of experience Talent headcount 		<ul style="list-style-type: none"> Voice of the customer Clarity and uniqueness of messaging 	
Client base	20%	Partnership ecosystem robustness	25%
<ul style="list-style-type: none"> Number of clients Referenceable clients 		<ul style="list-style-type: none"> Platform and software providers Start-ups and niche providers Academics and legal firms Consortium memberships 	
Industry coverage	20%	Experience across blockchain platforms	10%
<ul style="list-style-type: none"> Breadth of coverage (number of industries covered) Depth of coverage (maturity of services in each industry) 		<ul style="list-style-type: none"> Permissioned (private) Permissionless (public) 	
Use case coverage	20%	Contribution to market development	10%
<ul style="list-style-type: none"> Breadth of coverage Depth of coverage 		<ul style="list-style-type: none"> Code-base sharing Regulations and standards Talent development Other market challenges 	
Experience across blockchain value chain	20%	Intellectual property investments	15%
<ul style="list-style-type: none"> Strategic advisory Prototype development Production build System integration 		<ul style="list-style-type: none"> Platforms Solution accelerators Patents and other IP 	
		Ability to drive adoption beyond PoCs	20%

Service Provider Analysis

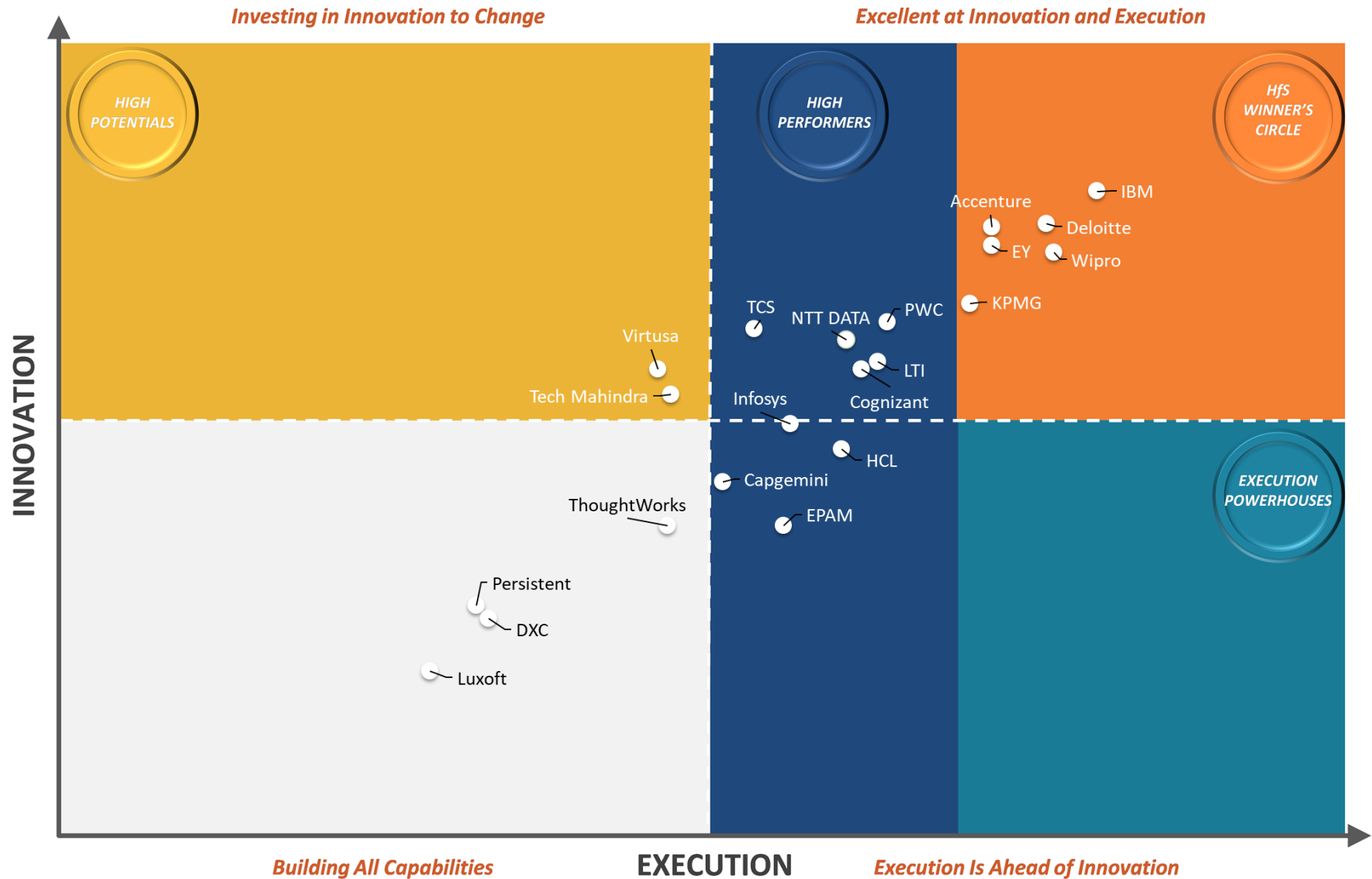


Guide to the Blueprint Grid

To distinguish service providers that show competitive differentiation across innovation and execution, HfS awards these providers the “HfS Winner’s Circle” designation.

	Execution	Innovation
 HfS Winner’s Circle show excellence recognized by clients in execution and innovation	Collaborative relationships with clients, services executed with a combination of talent and technology as appropriate, and flexible arrangements.	Articulate vision and a “new way of thinking,” have recognizable investments in future capabilities, strong client feedback, and are driving new insights and models.
 High Performers demonstrate strong capabilities but lack an innovative vision or momentum in execution of the vision relative to the HfS Winner’s Circle	Execute some of the following areas with excellence: worthwhile relationships with clients, services executed with “green lights,” and flexibility when meeting clients’ needs.	Typically, describe a vision and plans to invest in future capabilities and partnerships, and illustrate an ability to use digital technologies or develop new insights with clients.
 High Potentials demonstrate vision and strategy but have yet to gain momentum in execution of it	Early results and proof points from examples in new service areas or innovative service models, but lack scale, broad impact, and momentum in the capability under review.	Well-plotted strategy and thought leadership, showcased use of newer technologies or roadmap, and talent development plans.
 Execution Powerhouses demonstrate solid, reliable execution but have yet to show significant innovation or vision	Evidence of operational excellence; however, still more of a directive engagement between a service provider and its clients.	Less evident vision and investment in future-oriented capability, such as skills development, “intelligent operations,” or digital technologies.

HfS Blueprint Grid: Enterprise Blockchain Services 2017



Major Service Provider Dynamics: Highlights

Execution

- **Market commitment:** **Accenture, Deloitte, IBM, and Wipro** have made considerable investments in scaling up their blockchain practices on a relative basis and have robust plans to make further investments.
- **Client base:** **IBM** leads the market with 400+ blockchain-related client engagements. More than 80% of their blockchain engagements have been delivered by their own Blockchain Services team
- **Industry coverage:** Almost all service providers assessed are expanding coverage beyond financial services. **Deloitte and IBM** emerged as the providers with deepest adoption across all industries that they serve closely followed by **Wipro**.
- **Use cases:** **Accenture, EPAM, and NTT DATA** have the maximum breadth of use cases while **LTI, Accenture, and IBM** emerged with the maximum depth of adoption across its use cases.
- **End-to-end experience:** Given the nascency of the market, no service provider has yet developed mature system integration capabilities for blockchain services.

Innovation

- **Articulation of value proposition:** **Accenture, Deloitte, EY, KPMG, and IBM** most clearly articulate a complete and forward-thinking vision for blockchain services.
- **Ecosystem robustness:** **Accenture, Deloitte, EY, IBM, TCS, and Wipro** have developed the most robust ecosystem of technology providers, start-ups, academia, and consortia memberships. Almost all providers with the exception of **IBM** are offering a largely platform-agnostic go-to-market.
- **Contribution to market development:** Almost all players are contributing to market development by working with regulators, setting standards, developing talent, and contributing to thought-leadership. **IBM** is leading the effort followed by **TCS, Wipro, Virtusa, and LTI**.
- **Intellectual property:** We have seen tremendous momentum in development of solution accelerators as well as consulting frameworks for blockchain deployments.
- **Ability to drive adoption beyond PoCs and pilots** is emerging as a major source of differentiation. **IBM, Accenture, Deloitte, and Wipro** have amongst the highest number of live in-production clients.

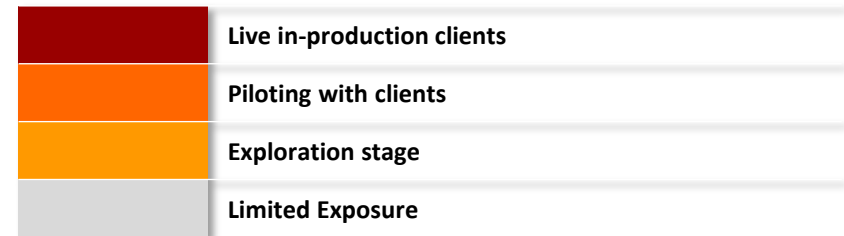
Service Provider Profiles



Value chain coverage



Industry and use case heatmap



Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> Market commitment Client base and industry coverage Experience across value chain Ecosystem robustness Ability to drive adoption beyond PoC 	<ul style="list-style-type: none"> Independent technology provider. Accenture is not focused on a single blockchain solution. It has alliances with the premier providers across a range of solutions that enables it to provide the right solution for each unique client situation that can potentially reduce the adoption barriers for clients. Commitment and Investment: Blockchain is a strategic focus area for Accenture. It is integrating different teams to build the blockchain practice: Accenture Research focuses on business and technology trends; Accenture Labs is responsible for blockchain technology development; Accenture Liquid Studio focuses on rapid ideation and prototyping; Accenture Innovation Center facilitates co-innovation with clients; Accenture Delivery Center focuses on large scale implementation and Accenture Ventures invests in emerging blockchain technology companies. Strong coverage across industries and use cases: Accenture is among the few players with use cases across most industries. While most use cases has shown good delivery capability with case studies across different industry segments and use cases. It has built a specialist team across strategy, operations, digital, technology, and verticals to engage with clients. Also Accenture tripled the number of blockchain resource count this year and plans to expand the team in near future. Robust ecosystem: Accenture brings together a robust ecosystem with partnerships across technology providers, blockchain platforms, industry consortia, start-ups, and academicians. 	<ul style="list-style-type: none"> Market development. While Accenture is at the forefront of helping clients adopt blockchain, it could potentially commit more resources towards market development through focused investments or initiatives in training, setting standards, or developing regulatory or policy frameworks that will help in overall market maturity. Solutions maturity: As blockchain technology and applications are still in infancy stage, like other service providers, Accenture is also facing challenging issues about lack of clarity in technical standards, legal frameworks, and interoperability issues.
Value Chain Coverage:		
Strategic advisory		
Prototype development		
Production build		
System Integration		

Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector
Use cases	Wallets	KYC	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	IoT	Pension

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> Over the past two years, Accenture has worked with over 60 enterprises on blockchain-related initiatives Accenture has established a Blockchain Centre of Excellence in Sophia Antipolis The Accenture blockchain practice brings together a team of specialists across strategy, operations, digital and technology 	<ul style="list-style-type: none"> Accenture has experience across all leading blockchain platforms Accenture's experience across platforms has enabled it to develop innovative solutions such as its redaction capability, hardware security module interface and an evaluation framework that are applicable across all blockchain solutions Accenture partnered with Microsoft and Avanade on ID2020 to solve the digital identity challenges of more than 1.1 billion individuals 	<ul style="list-style-type: none"> Member of consortia including Hyperledger, Ethereum Enterprise Alliance, R3, B3i, and Chamber of Digital Commerce Partnerships with technology providers such as Microsoft, Amazon Web Services, IBM, and other industry platforms Partnerships with blockchain-focused niche players and start-ups including BigChain, BlockApps, Chain, Digital Asset, Monax, Consensys, MultiChain, Quorum, R3 Corda, Ripple, Z Cash Academia and research partnerships including University of Cambridge, Blockchain Research Institute, Stevens Institute of Technology, and Massachusetts Institute of Technology

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> Large global team with experience across value chain Breadth and depth of coverage Ecosystem robustness Referencible client Ability to drive adoption beyond PoC 	<ul style="list-style-type: none"> Investment and commitment. Deloitte has developed over 30 working prototypes and made 12+ targeted investments in specific blockchain assets creation. It's also conducting internal blockchain education programs for both business and technical blockchain proficiency. End-to-end services. Deloitte is able to provide its clients end-to-end services across innovation and ideation, strategy formulation, prototyping, and production build. Deloitte provides the breadth and depth of blockchain including consulting, tax, audit, risk and financial advisory. Combination of strategic thinking, industry expertise, and technical capability. Industry experts understand the business processes and pain points, helping clients determine where blockchain makes sense and advising on potential new business models. Deloitte's global teams have developed deep expertise in major technology components. Technology agnostic approach. Deloitte has credible experience across 10 blockchain platforms allowing it to select the right technology stack that is best equipped to solve the clients' pain points. Ecosystem robustness. Deloitte has built an extensive strategic ecosystem of start-ups, technology providers, academia, and consortiums to bring the right technology and expertise to the relevant business challenges through strong collaboration. Ability to drive adoption beyond PoCs across industries. Deloitte has several clients that are now live with blockchain solutions across multiple industries. Besides the end-to-end services portfolio and holistic technical and domain expertise, Deloitte is able to leverage its network to bring together consortiums critical to adoption. 	<ul style="list-style-type: none"> Integrated go-to-market across blockchain, AI, IoT, and other emerging change agents. While Deloitte has strong capabilities across multiple emerging technologies including blockchain, a truly integrated engagement model for clients is still evolving. Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. Deloitte will need to continue to invest and educate the market to overcome these challenges.

Value Chain Coverage:

Strategic advisory
Prototype development
Production build
System Integration

Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector
Use cases	KYC, wallets	Auditing	Regulatory and compliance	Asset management	Trading	Payments and settlements	Lending	Investing, transfer pricing	Trade finance	Order-to-cash
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Loyalty	Voting

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> Dedicated global blockchain practice with 800+ blockchain-proficient resources including 55+ full-time resources Blockchain Labs in Americas (NYC), EMEA (Dublin), and APAC (Hong Kong) with development teams in 9 countries, and blockchain-proficient resources in 20+ global countries 30+ PoCs built for 20+ Clients include European bank, Central Bank in China, Canadian Bank, British bank, Global Oil & Gas company, large insurance provider as well as blockchain pilots with US government agencies 	<ul style="list-style-type: none"> Expertise across 10 blockchain platforms 12+ targeted investments in specific blockchain assets including <ul style="list-style-type: none"> RegChain: A blockchain-based platform that streamlines the traditional regulatory reporting DCoins: A blockchain-based employee engagement and rewards platform Mercury: Trade finance solution by capturing details in all documents via smart contracts on the blockchain ReInsurance Solution: A platform with master smart contracts for secured validation and policy activation 	<ul style="list-style-type: none"> 29 current official alliances Member of both Enterprise Ethereum Alliance and Hyperledger Project 14 key alliances include Salesforce, SAP, Oracle, Workday, IBM, HP, Apple, Google, Facebook, Amazon, Microsoft, Mulesoft, ServiceNow, and Adobe Priority alliances with Opentext, Informatica, Fujitsu, Tencent, Alibaba Group, Dell/EMC Relationships with government, academia (e.g., UT Austin, MIT, Singularity University) Partnerships with leading blockchain tech startups such as Ripple, Symbiont, AlphaPoint, Stellar, Loyal, SETL Part of industry associations like the TMForum

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights		Strengths								Challenges		
<ul style="list-style-type: none">• Commitment• Robust client base• Referencible client• Broad industry coverage• Experience across value chain• Ability to drive adoption beyond PoC		<ul style="list-style-type: none">• Investment and commitment. EY has 12+ blockchain solution, 50+ engagements, and three dedicated centers in NYC, London, and India. It is also integrating the tax and audit teams into the blockchain development process.• End-to-end service. EY offers the full service portfolio across blockchain implementation, licensing blockchain solutions and software, blockchain-as-a-service, and audits of blockchain-based businesses. Its technical capability backed by strong domain and consulting skills allows it to create business-focused blockchain solutions that includes perspectives on process, tax, audit, and compliance impact.• Technology agnostic approach. EY has credible experience across multiple open-sourced blockchain platforms allowing it to select the right technology stack that is best equipped to solve the clients’ pain points.• Ability to drive adoption beyond PoCs. Around 10% of EY’s clients are in early stage production system and 20% in pilots and PoC phase. Its ability to drive adoption into live production in a nascent space like blockchain is driven by the choice of use cases where there is shortage of a trusted intermediary versus dis-intermediation itself.								<ul style="list-style-type: none">• Expanding ecosystem. EY has strong and deep partnerships with Hyperledger, IBM, SAP and Microsoft. It is in the process of further expanding that list of partners to include other major enterprise software vendors and industry consortia.• Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. EY will need to continue to invest and educate the market to overcome these challenges.		
Value Chain Coverage:												
Strategic advisory												
Prototype development												
Production build												
System Integration												
Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	CPG, Agriculture Products	
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance		
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting		
Blockchain practice overview						Blockchain platform and technology capability				Blockchain ecosystem and partnerships		
<ul style="list-style-type: none">• 500+ blockchain-proficient resources with 30+ dedicated developers• Three major labs focused on blockchain<ul style="list-style-type: none">• Financial services-focused center in New York• R&D lab in London staffed by cryptographers, physicists, and experienced developers• Off-shore delivery center in Trivandrum, India• Blockchain skills in San Francisco, San Jose, Tokyo, Seoul, Hong Kong, Singapore, Sydney, Dubai, Zurich, Berlin, and Paris.• 50+ blockchain engagements in the areas such as supply chain, maritime insurance, vehicle ownership and management, smart asset management, trading and settlements, product traceability, and auditing						<ul style="list-style-type: none">• EY's blockchain platform expertise includes Ethereum, Hyperledger, Corda, and Exonum among others• EY's blockchain solutions portfolio includes<ul style="list-style-type: none">• In production: Digital Identity Management, Wine Blockchain, Blockchain Explorer• In pilot: Ops Chain, Blockchain Audit tools, Ops Chain procurement, Ops Chain Bill of Materials, Ops Chain Traceability, Employee Skills tracker• In development: Cross Border Trade Services, Ops Chain Logistics, Maritime Insurance				<ul style="list-style-type: none">• EY is a member of the Hyperledger project• It has partnerships with IBM and Microsoft and works on developing solutions with BitFury and BTL• EY also partners with academic institutions such as Cambridge University		

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> Market commitment and contribution Strong client base; adoption beyond PoC stage Industry and use case coverage Ecosystem robustness 	<ul style="list-style-type: none"> Strong contributions to blockchain market development. As one of the 17 founding members of Hyperledger, IBM contributed to the initial code-base of Hyperledger Fabric and Hyperledger Composer. To help meet the increasing demand for a skilled technical workforce trained in blockchain, IBM is committing a wide range of resources free of charge to more than 1,000 universities in the IBM Academic initiative. Full-stack blockchain capabilities. IBM is a founding member of Hyperledger and has launched the IBM Blockchain Platform for business workloads; they offer hosting and support solutions through the IBM Cloud, and make blockchain real for clients with an engagement model across exploration, piloting, production, and integration. IBM is using its Watson platform to pilot cognitive capabilities for blockchain. Its Watson IoT Platform enables IoT devices to send data to blockchain ledgers, enabling deployment in IoT based blockchain use cases. Robust client-base and ecosystem. IBM has 400+ blockchain related client engagements with several "live" in-production blockchain clients. Since the formation in Dec 2016, IBM Blockchain Ecosystem includes 260+ members (23% financial services, 15% ISV/SI/VAR/CSP, 11% supply chain, 6% public sector). More than 80% of their blockchain engagements have been delivered by their own robust IBM Blockchain Services team. A strong combination of technology and experienced services. 	<ul style="list-style-type: none"> Multi-platform strategy with focus on Hyperledger: IBM has a Hyperledger-focused blockchain go-to-market though has delivered some of its largest clients with other platform technology such as Axoni. As blockchain protocols and interoperability standards are still evolving, time will tell whether their strategy of "on or with Hyperledger" is a smart strategy. Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. IBM will need to continue to invest and educate the market to overcome these challenges.
Value Chain Coverage:		
Strategic advisory		
Prototype development		
Production build		
System Integration		

Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Retail, food, agri-products
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Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> IBM has been involved with blockchain since 2015 incorporating IBM Design Thinking & "Garage" hands on collaboration to accelerate adoption Offers global Bluemix Garages in which clients can work with blockchain using design thinking 400+ client engagements including Maersk, DTCC, everledger, CLS, Mizuho, Credit Mutuel Arkea, Walmart, Bank of America, HSBC, Tokyo Stock Exchange, Union Pay, MUFG 	<ul style="list-style-type: none"> IBM Blockchain Platform (released in 2017) allows enterprises to develop, govern, and operate blockchain solutions on Hyperledger Fabric Blockchain beta solutions: food safety, global trade distribution Blockchain hosting and support solutions through IBM Bluemix Founding and Premier member of Hyperledger; contributor to code-base of Hyperledger Fabric / Composer. Also chairs its technical community 	<ul style="list-style-type: none"> IBM Blockchain ecosystem includes 260+ members <ul style="list-style-type: none"> Financial services (23%) including Banco Atlantida, Page Solutions, Vectigal, Travelers, Tradeix, Sooryen Tech. ISV/SI/VAR/CSP and other business partners (23%) including ATS, Altoros, Assist, Belltane, Cedrus, Certsys, Croz, Eidiko, eZly, Hitachi, Rocket, Saturn, Sirius, Softweb, and Syntel Supply chain (11%) including Not Rocket Science, ET, Flex, Gemalto Public Sector (6%) including NiyamiT, Semantix Lab, bigroup, SimplifyRx

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights		Strengths						Challenges		
<ul style="list-style-type: none">• Commitment and investment• Experience across value chain• Strong BFSI client base• Robust ecosystem• Ability to drive adoption beyond POCs		<ul style="list-style-type: none">• End-to-end blockchain service. KPMG’s digital ledger services span across strategic prioritization, prototype and use case development, production systems development, systems and operations integration, and managed services. It also provides regulatory guidance, optimizing control environment, data governance, platform audit and tax services.• Business-case driven transformation. Through a blend of local consulting and “lighthouse” development capability, KPMG can help its clients maximize blockchain-related ROI. Also it follows a co-innovation approach with its clients to develop blockchain solutions.• Blockchain platform agnosticism. KPMG is agnostic on blockchain platforms that allows them to consult clients on which blockchain protocol to use and have a service offering around matching this with the specific requirements and priorities of the use case.• Blend of strategic consulting, domain experts, system architects, and technical specialists. KPMG is able to bring a cross-functional and global teams into play while tackling individual blockchain engagements and indeed co-investments with clients.• Strong partnership ecosystem. KPMG has developed a strong partnership ecosystem and works very closely with a number companies For example, The KPMG, Microsoft alliance brings together the MS Azure Blockchain Platform, and KPMG Professional Services to provide an end-to-end blockchain solution experience.						<ul style="list-style-type: none">• Coverage beyond BFSI: KPMG's major blockchain engagement clients are from banking, insurance, and capital market industry. The market opportunity for use of blockchain technology beyond financial services is exploding in verticals such as manufacturing, healthcare, telecom, and others.• Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. KPMG will need to continue to invest and educate the market to overcome these challenges.		
Value Chain Coverage:										
Strategic advisory										
Prototype development										
Production build										
System Integration										
Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting
Blockchain practice overview				Blockchain platform and technology capability				Blockchain ecosystem and partnerships		
<ul style="list-style-type: none">• Blends blockchain-consulting services with “Lighthouse” development capability• Over 29 different countries participating in the development and commercialization of blockchain initiative in their respective local markets• KPMG “Lighthouse” is a Center of Excellence, comprised of 200+ professionals helping clients seize the business value of new technologies such as blockchain• 30+ engagements including European Central Bank, Luxembourg Stock Exchange, Monetary Authority of Singapore, HSBC, DZ Bank, UniCredit, Shell, Santander, MUFG, Westpac, OCBC Bank, Lab Group				<p>KPMG goes to market with carefully selected technological and industry partners to co-create partially built solutions that can then continue to be shaped with our mutual clients. Current go-to-market propositions include:</p> <ul style="list-style-type: none">• Payments• Remittances• Trusts• Pensions• Personal & Casualty insurance• Mortgages• Trade Finance• Derivatives• Reinsurance• KYC• Funds DLT				<ul style="list-style-type: none">• Microsoft: Leveraging Microsoft's Azure cloud platform to deploy blockchain use cases• Cegeka: Developed an award winning Trade Finance solution.• BluZelle: Prototype dev. using smart contracts.• ConsenSys: Ongoing collaboration to combine KPMG's domain expertise with ConsenSys's technical expertise• IBM: For clients looking for solutions using the Hyperledger and IBM’s Bluemix environment• Chromaway and BlocEx: Co-creation of blockchain solutions• R3: Ongoing industry collaboration with a focus on blending our core business consulting skills to help scale up use cases within the consortium		

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> Commitment Industry and use case coverage Experience across value chain Referencible client Ecosystem robustness Ability to drive adoption beyond PoC 	<ul style="list-style-type: none"> Investment and commitment. Wipro is investing significantly in building skills, competencies, and innovative solutions alongside a robust IP/patent portfolio. Wipro utilizes its \$100Mn strategic fund to invest in blockchain-specific partnerships and potential acquisitions. It has also institutionalized a 'Blockchain Council' for senior leaders and domain experts across the organization. Wipro is also investing in several industry leadership initiatives (speaking in global blockchain events, multiple research and thought leadership initiatives, and hackathons) Robust client portfolio and ecosystem. Wipro has 50+ client engagements and 84+ identified use cases across multiple industries. It is a member of both Ethereum Enterprise Alliance and Hyperledger project along with a robust ecosystem of academia, start-ups, and technology players. Talent development. Wipro has developed robust scale of 800+ blockchain-proficient resources with plans to increase to 5000+ by 2020. It has created blockchain academy that looks into internal and external training & certification. Integrating blockchain with emerging technologies. Wipro is integrating blockchain into its connected vehicle solution "Wipro AutoInsights" for in-vehicle services. It is leveraging Wipro Holmes (AI) with blockchain to explore use cases in both financial and non financial services. Contributions to blockchain market development. Wipro is a member of the two leading blockchain consortia (Hyperledger and Enterprise Ethereum Alliance) and works with several regulators to support setting up of policies and guidelines for blockchain use and adoption. It is also engaging the global blockchain community through its crowdsourcing platform, Topcoder. Ability to drive adoption beyond PoCs across industries. Wipro has several clients that are now live with blockchain solutions across multiple industries, and also a number of pilot engagements are expected to be live soon. 	<ul style="list-style-type: none"> Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. Wipro will need to continue to invest and educate the market to overcome these challenges. Strategic consulting: Wipro is already a leading provider in the Blockchain strategic advisory, technology and ecosystem services but has the opportunity to further complement existing offerings inorganically through strategic investments

Value Chain Coverage:

Strategic advisory
Prototype development
Production build
System Integration

Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Retail and CPG
Use cases	KYC/ Wallets	Auditing	Regulatory / Compliance	Asset management	Trading	Payments and settlements	Lending	Investing / transfer pricing	Trade finance	Order-to-Cash	
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Loyalty	Voting	

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> Dedicated global blockchain practice with 800+ technical resources and 150+ advisors/consultants 50+ client engagements around 84 use cases across different industries Clients include Global financial institution based in US, European renewable energy provider, global IT giant, European consumer goods manufacturer and others 	<ul style="list-style-type: none"> Expertise across multiple blockchain platforms including Ethereum, Hyperledger Fabric, Corda, Quorum, and Multichain Blockchain solutions and assets include <ul style="list-style-type: none"> Blockchain Consulting Frameworks: Blockchain Platform Evaluation Matrix, Blockchain Smart Contract Test Assurance Framework, Blockchain ROI/Business Case Assessment, Blockchain Platform Evaluation Matrix etc. Industry Solutions: Nine blockchain solutions in BFSI, manufacturing, retail and consumer goods industries across areas such as delivery vs payments, trade finance, anti-counterfeit solution, cross-border remittances, tri-party collateral management, and airworthiness certificate tracking Technology Assets: Blockchain Innovation Lab (Lab-as-a-Service) and Blockchain App Fabric (PaaS offering) 	<ul style="list-style-type: none"> 15+ current official alliances Member of both Enterprise Ethereum Alliance and Hyperledger Project Its strategic partners include Microsoft, IBM, Oracle, SAP Relationships with government, academia (e.g., IISC, University of California, Berkley) Working with regulators like ASSOCHAM, PASA, RBI, NPCI, and NACHA to draft policies and guidelines for blockchain use and adoption

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> End-to-end capability Global coverage Integrated with digital transformation 	<ul style="list-style-type: none"> Strategy through execution” model. With joint business consulting, IT consulting, and execution delivery, Capgemini is capable of providing end-to-end Distributed Ledger Technology related capabilities Global capability. With Innovation Centers of Excellence in India, Asia, Continental Europe and the Americas, Capgemini offers cohesive global coverage that will enable its customers to scale their products and services. Customer Experience: Capgemini has established several "Applied Innovation Exchanges" across the globe that serve as an immersive, collaborative digital facility to engage its clients offsite with blockchain technology. Holistic, Integrated methodology. Distributed Ledger Technology is an interdisciplinary approach to Digital Transformation. Capgemini incorporates machine learning, AI, RPA or other capabilities to scale Smart Contract logic to enable seamless legacy and new service / revenue stream integration 	<ul style="list-style-type: none"> Scaling up DLT practice: Capgemini has a few deep client engagements in DLT , but overall, the number of client engagements is still low on a relative basis. Coverage beyond BFSI. The market opportunity for use of DLT technology beyond financial services is exploding in verticals such as manufacturing, healthcare, telecom and others Ecosystem. While Capgemini has established partnerships with multiple DLT platforms, a complete ecosystem requires alliances across other technology firms, industry consortia, start-ups, academicians, and others. Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. Capgemini will need to continue to invest and educate the market to overcome these challenges

Value Chain Coverage:

Strategic advisory
Prototype development
Production build
System Integration

Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Automotive
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance	
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting	

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> Capgemini’s Distributed Ledger practice is a part of Digital Transformation practice Innovation Centers of Excellence in India, Asia, Continental Europe and the Americas Also established several "Applied Innovation Exchanges" across the globe that serve as an immersive, collaborative digital facility to engage with clients Delivered POCs for 4 clients with 1 Live (in-production) client 	<p>Capgemini's blockchain solutions portfolio caters to Energy trading, Financial trading and risk management, Data Security, Vehicle ownership etc.</p> <ul style="list-style-type: none"> Distributed Energy Resources: Blockchain application for energy trading Data Security: Blockchain enabled cryptography for data transaction Electric Vehicle Ownership Share: Semi-private blockchain for Electric Vehicles including financial data, history of usage, etc. Critical Infrastructure Protection: Cloud based private blockchains for real-estate sector 	<ul style="list-style-type: none"> Partnerships with Ripple, Bigchain DB, Hyperledger, R3, Paxos, Loyyal, Symbiont, BTL.

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights		Strengths						Challenges			
<ul style="list-style-type: none">• Market commitment• Expertise across platforms• Strong BFSI experience• Credible IP with solution accelerators• Clarity in value proposition• Referencible client		<ul style="list-style-type: none">• Business-first approach. Cognizant’s primary go-to-market for blockchain is to deliver real-world experience for clients through a business-first mindset without a technology bias. It has strong breadth and depth of experience across 20+ platforms enabling its platform-agnostic go-to-market• Pre-built solution accelerators. Cognizant has developed 18+ solution accelerators to reduce time to market. A good example is B-Verify, Cognizant's proprietary blockchain supply chain platform that acts as a provenance ledger for the material movement from suppliers, manufacturers, and retailers to consumers.• Strength In the financial services vertical: Most of Cognizant's blockchain services clients are financial organizations. Its focus areas of engagements with US, European, and Japanese banking organizations include payment, trade finance, KYC, and claim management, making blockchain real for business cases related to improved customer experience, operational efficiency improvement, cost savings etc.						<ul style="list-style-type: none">• Going beyond PoCs. Most of Cognizant’s experiences thus far are in PoC stage. Very few are in production yet. While there is an overall market adoption challenge given the nascency of blockchain, the ability to support a client through to production is emerging as a clear differentiator.• Coverage beyond BFSI. The market opportunity for use of blockchain technology beyond financial services is exploding in verticals such as manufacturing, healthcare, telecom, and others. While Cognizant is developing solutions beyond BFSI, current blockchain engagements are primarily in the BFSI sector.• Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. Cognizant will need to continue to invest and educate the market to overcome these challenges.			
Value Chain Coverage:											
Strategic advisory											
Prototype development											
Production build											
System Integration											
Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Retail, education
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance	
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting	
Blockchain practice overview				Blockchain platform and technology capability				Blockchain ecosystem and partnerships			
<ul style="list-style-type: none">• Cognizant has been involved with blockchain since 2015• 200+ blockchain SMEs with 40+ dedicated strategy consultants and 60+ technical developers• 40+ projects inclusive of strategy, POCs, pilots, and live production blockchain• 20+ clients include state government, consortium of 13 Indian insurance providers, a large grocery retailer in APAC, European utility company, European financial services company, Japanese banking organization, US commercial bank, US-based insurance provider, US-based payment company				<ul style="list-style-type: none">• Cognizant has expertise in 20+ blockchain platforms with official partnerships with Multichain, Microsoft Azure, r3, Chain and BigchainDB• Cognizant has 18+ blockchain solution accelerators including:<ul style="list-style-type: none">• B-Verify: Blockchain supply chain platform• Blockchain Collateral Management Platform: Platform (built on Corda) for creating and managing bilateral contracts• Genesis of Things: Platform for 3-D printing supply chain• Blockchain Invoice Registry: Decentralized registry for securing priority interest on assets				<ul style="list-style-type: none">• Industry collaboration across Chamber of Digital Commerce, Blockchain Intellectual Property Council, Smart Contracts Alliance, Microsoft Azure, and HIMSS• Developing an ecosystem of partnerships with blockchain frameworks, technology providers, start-ups, academicians, legal firms, and consortiums			

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights		Strengths						Challenges					
<ul style="list-style-type: none">In-house tools and technical expertiseBreadth of Industry coverageExperience across blockchain platforms		<ul style="list-style-type: none">Software engineering DNA. Blockchain is a good fit for EPAM as it has a strong software engineering background. Blockchain has been woven into EPAM’s Innovation as a Service which is focused on incorporating agile ideation and lean engineering to develop customer-focused solutions.In-house solutions. EPAM has built a number of in-house solutions that can help its clients jump-start the blockchain journey. Digital Assets Management Platform (DAMP) is a digital asset transaction platform across industries; OTC Matching is a derivatives settlement platform for financial services; Open Betting Platform is a smart contract based bets settlement platform.Cross-industry go-to-market. Most of EPAM's solutions can be leveraged across industries, indicating the flexibility of its chosen use cases.Blockchain platform expertise. EPAM has experimented with a number of blockchain platforms including Ethereum, Bitcoin, Hyperledger Fabric, R3 Corda, and Juno in exploring potential industry solutions.						<ul style="list-style-type: none">Partnership ecosystem. EPAM is leveraging its in-house talent and experience to work with open source platforms. However, an ecosystem approach is evolving in the market that drives collaboration across industry consortia, start-ups, academia, technology providers, and blockchain platforms.Strategic advisory. EPAM is perceived as a technical partner, which creates a challenge for EPAM to take on more business transformation related upfront strategic advisory work required to develop an end-to-end service portfolio for its clients.Going beyond PoCs. EPAM’s experiences thus far are in lab experiment or PoC stage. While there is an overall market adoption challenge given the nascency of blockchain, the ability to support a client through to production is emerging as a clear differentiator.Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. EPAM will need to continue to invest and educate the market to overcome these challenges.					
Value Chain Coverage:													
Strategic advisory													
Prototype development													
Production build													
System Integration													
Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Gaming		
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance			
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting			
Blockchain practice overview				Blockchain platform and technology capability					Blockchain ecosystem and partnerships				
<ul style="list-style-type: none">EPAM Blockchain Competency Center was launched in 2015100+ blockchain-proficient resources including 20+ dedicated resourcesDelivered POCs to 10+ clients				<ul style="list-style-type: none">EPAM’s blockchain platform expertise include Ethereum, Bitcoin, Hyperledger Fabric, R3 CordaEPAM’s blockchain solutions portfolio includes<ul style="list-style-type: none">OTC Trade Capture and Matching (Ethereum)Digital Assets Management Platform (Ethereum + Amazon S3 + sMPC)Open Betting Platform (Ethereum)Digital Notary Service (NXT)Loyalty Network (Ethereum)					<ul style="list-style-type: none">EPAM has no official partnership in blockchain. It leverages its Software Engineering DNA for blockchain solutions development				

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> Strong technical capability Robust platform and solution accelerators Referencible client End-to-end go-to-market vision Breadth of industry and use case Coverage 	<ul style="list-style-type: none"> Platform-based approach. Co-trust Platform is a managed platform based on Hyperledger Fabric (Ethereum version is WIP). It is a hosted ready-to-use platform for incubating enterprise blockchain use cases with pre-written services that are common across blockchain applications. The Co-Trust Platform is developed to enable speed to market in a secure manner. End-to-end go-to market strategy. HCL's blockchain service offerings include consulting (adoption strategy, business case definition, platform selection, change management), implementation (pilots, MVPs, and solution development) and ecosystem (integration with legacy, on-boarding, and monitoring). Coverage beyond BFSI. HCL is anticipating the blockchain market opportunity beyond financial services to manufacturing, healthcare, telecom, and other verticals. As a result, it is developing use cases in supply chain operations, bill discounting and invoice financing, digital rights management and royalties, smart contract driven bonds, patient data management, clinical trial management, and clearing and settlements. Integrating IoT and AI with blockchain. HCL near future plan is to integrate AI and blockchain through co-trust as well as to leverage blockchain to boost IoT security. 	<ul style="list-style-type: none"> Scaling up blockchain practice. Though HCL has a broad end-to-end vision for blockchain services, the overall practices needs more investment in scaling up. Expanding partnership ecosystem. HCL is building a nice partnership ecosystem across start-ups, blockchain platforms, academia, and legal firms but it is not yet fully established yet. It is currently in the process of establishing relationship with Multichain and Enterprise Ethereum Alliance, among others. Going beyond PoCs. HCL's experiences thus far are in lab experiment or PoC or Pilot stage. While there is an overall market adoption challenge given the nascency of blockchain, the ability to support a client through to production is fast emerging as a clear differentiator. Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. HCL will need to continue to invest and educate the market to overcome these challenges.

Value Chain Coverage:

Strategic advisory

Prototype development

Production build

System Integration

Industry coverage

Manufacturing

Life sciences

Healthcare

Financial services

Professional services**

Insurance

Travel and hospitality

Telecom and media

Energy and utilities

Public sector

Use cases

Wallets

Auditing

Compliance

Asset management

Trading

Payments and settlements

Lending

Investing

Trade finance

Microfinance

Claims processing and payment

Identity

Security

Anti-counterfeiting

Provenance, track and trace

Master patient index

Longitudinal health records

Clinical trials

Title records and ownership recording

Voting

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> HCL Blockchain Labs is a part of its Digital and Analytics practice Blockchain Labs was established over a year ago with 20+ dedicated resources including evangelists, core architects, functional leads, developers Working on initial consulting phases with 7+ existing clients including global insurance company, financial service provider, American financial services and communications company, Australian bank, pharmaceutical company, and a medical equipment manufacturer 	<ul style="list-style-type: none"> Experience across Ethereum, Hyperledger, R3, Multichain, and Microsoft's Blockchain as-a-service HCL's in-house CoTrust Platform is a ready-to-use platform for incubating enterprise blockchain use cases with pre-written services common across blockchain applications 	<ul style="list-style-type: none"> Partnership with IBM; Several other partnerships with Microsoft, Multichain, and Ethereum in-progress Also developing ecosystem across start-ups, academicians, and legal firms

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights		Strengths								Challenges	
<ul style="list-style-type: none">• Experience across value chain• Strong in-house technology platforms• Strong BFS breadth and depth• Ability to drive adoption beyond PoC		<ul style="list-style-type: none">• End-to-end offering. Infosys’ blockchain services include Blockchain Incubation As-a-Service (trends research, design thinking, rapid prototyping), Blockchain Services (advisory, consulting, development, testing), Blockchain Solutions (industry specific solutions, integration with existing enterprise IT and process), and blockchain platform (scalable and asset agnostic platform). Infosys also follows a Design Thinking-based blockchain assessment.• EdgeVerve Blockchain Framework – Infosys’ in-house blockchain platform. EdgeVerve Systems, a wholly-owned subsidiary of Infosys, also enables to strengthen Infosys’s blockchain capabilities.• Integration capability with other emerging technologies. Infosys has the ability to combine blockchain with IoT, AI, Smart Analytics to amplify the value proposition.• Technology platform agnostic approach. Infosys has experience across blockchain platforms and its blockchain framework is platform agnostic.• Ability to go beyond PoCs in BFS. Emirates NBD in UAE and ICICI Bank in India are live on a blockchain network. Infosys has over 25 years’ experience of working with clients in the financial services industry, which has enabled it to develop blockchain specific use cases such as remittance and trade finance.								<ul style="list-style-type: none">• Start-up partnerships. Infosys has deep relationships with platform and technology players such as Ethereum, Microsoft, Oracle, and IBM and is in the process of establishing more partners. However, overall collaboration with start-ups and niche players is still lacking.• Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. Infosys will need to continue to invest and educate the market to overcome these challenges.	
Value Chain Coverage:											
Strategic advisory											
Prototype development											
Production build											
System Integration											
Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Retail, CPG
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Mortgage	
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Loyalty	
Blockchain practice overview				Blockchain platform and technology capability				Blockchain ecosystem and partnerships			
<ul style="list-style-type: none">• Blockchain practice was a part of Infosys’ Center for Emerging Technology Solutions group. It recently became a separate service line• The blockchain core team has 30 to 40 members supported by an extended team with industry SMEs to identify and create industry use cases and solutions• 25+ clients (15+ in FS) including Emirates NBD, ICICI Bank, Leading agri provider, leading financial giant, European loyalty service provider, financial services company, US-based energy major				<ul style="list-style-type: none">• Infosys’ blockchain platform expertise Ethereum, Hyperledger, Multichain, and Ripple among others• The EdgeVerve Blockchain Framework for Financial services is a permissioned ledger that allows banks to rapidly deploy blockchain-based services for various business needs• EdgeVerve allows banks to rapidly deploy blockchain-based services for varied business areas such as payments and trade finance. Also the platform can be utilized for identity services, document management, remittances, reconciliation and transaction services, and other purposes				<ul style="list-style-type: none">• Member of Enterprise Ethereum Alliance.• Select member of Microsoft Blockchain Partner Council (BPC)• Works closely with IBM Bluemix and Hyperledger• Partner on the newly launched Oracle Blockchain Cloud Service• Partnership discussions with Multichain and Ripple• Research collaboration with the University of Oxford, The Alan Turing Institute, DACS, and the University of Warwick			

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Larsen & Toubro Infotech (LTI)

High Performer

Robust technical blockchain services with in-house solution accelerators and a start-up approach



Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> Referencible client Strong technical capabilities Ecosystem robustness Integrated approach In-house solution accelerators Market development initiatives 	<ul style="list-style-type: none"> Integrated approach under MOSAIC. LTI is looking at blockchain in conjunction with promising technologies such as IoT, OCR, and cognitive technologies under its Mosaic Platform. Start-up approach. LTI offers a start-up approach to innovation through business innovation centers located at global client locations. It has onboarded more than 350 start-ups using its NILE platform. It partners with academia like MIT CISR and IIT Mumbai. Market development efforts in India. LTI is partnering with Industry Consortia and startups like Zero Field Labs and Primechain to educate and influence Banking and Financial services entities in India. LTI recently hosted the Buterin Hackfest in partnership with the Ethereum Foundation as part of the Blockchain India Week 2017 aimed at bringing blockchain awareness to India. It also recently hosted the Bankchain Consortium meeting which saw participation from prominent banks and FIs from India and the Middle East. Solution accelerators and enablers. LTI has identified 50+ use cases and created 15+ ready-to-deploy blockchain solutions. Its Canadian Transfer Agency platform, Unitrax, with \$750 billion assets under management, gives it a unique platform to build blockchain led solutions for custody clients and understand the impact of disintermediation. 	<ul style="list-style-type: none"> Scaling up blockchain practice. Though LTI has a broad end-to-end vision for blockchain services, the overall practices needs more investment in scaling up. It has plans to scale to 200+ resources in 1.5 years Going beyond PoCs. LTI's experiences thus far are in the Conceptual/PoC/Pilot stage. However, the company is rapidly creating a strong foothold by initiating development on a couple of production grade projects. While there is an overall market adoption challenge given the nascency of blockchain, the ability to support a client through to production is fast emerging as a clear differentiator. Brand recognition. Although LTI has decent capabilities in the blockchain services market, it needs to augment its brand recognition. Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. LTI will need to continue to invest and educate the market to overcome these challenges.

Value Chain Coverage:

Strategic advisory
Prototype development
Production build
System Integration

Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Retail
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance	
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting	

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> Blockchain is a part of Digital Consulting practice 50+ resources with blockchain labs in Mumbai, Paris, Munich, and US 20+ engagements for 10+ clients including Nordic banking organization, global CPG major, global reinsurer company, Indian construction organization, Australian Bank 	<ul style="list-style-type: none"> LTI's blockchain platform expertise include Ethereum, Hyperledger, Quorum and Multichain Blockchain incorporated into LTI's MOSAIC platform that provides IoT, RPA, decision-science, AR/VR, and AI capabilities LTI's blockchain solutions portfolio includes <ul style="list-style-type: none"> Trade Finance Platform: Platform for tracking consignments across multiple entities Raw Material Tracking: IoT enabled tracking of raw materials for origin details and shipment status Supply Chain Optimization Solution: Supply chain track and trace solution on blockchain assisted by temperature sensing technology 	<ul style="list-style-type: none"> LTI is one of the first members of the Microsoft Blockchain Council and is partnering with several blockchain based start-ups and tech providers. It also draws from its strong association with academia such as MIT, IIMs and ISI

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights		Strengths							Challenges		
<ul style="list-style-type: none">Investment and market contributionReferencible clientsBreadth of industry and use case coveragePrototype development capabilityRobust ecosystem		<ul style="list-style-type: none">In-house solution accelerators. NTT DATA has developed multiple blockchain assets to speed up PoC (cryptocurrencies wallets, blockchain cloud nodes, timestamping service, etc.). It has also launched a R&D initiative called Workchain to create accelerators for deploying and benchmarking blockchain platforms, smart contract management and testing of blockchain deployments.Technology agnostic strategy. Strong technical expertise with 140+ blockchain resources across the globe with experience across private and public blockchain platforms to chose based on client and use case requirements.Robust ecosystem and market development initiatives. NTT DATA is a founding member of Hyperledger and Lyra. It is also involved for the development of new blockchain platforms such as Iroha. It has also developed a robust set of partnerships with blockchain frameworks, technology providers, start-ups, academicians, and consortiums. NTT DATA also conducts multi-country regulatory studies including the impact of PSD2 on global payments.Strong technical capability: NTT DATA is focusing on in-house innovation for blockchain offerings. Its blockchain CoEs are spread across five countries including Japan, Italy, Spain, UK, and USA. It is also exploring integrated solutions with blockchain, IoT, and analytics in the areas of supply chain and connected health.Cross-industry coverage. NTT DATA has develop 40+ use cases across BFSI, Energy, telecom, media, retail, professional services, healthcare, life sciences, and public sector.							<ul style="list-style-type: none">Going beyond PoCs. NTT DATA experiences thus far is in PoC and Pilot stage. While there is an overall market adoption challenge, the ability to support a client through to production is fast emerging as a clear differentiator.End-to-end service offering. Clients rely on NTT DATA primarily for its technical capability to develop PoCs. While NTT DATA is starting to provide advisory services, there is an opportunity to further expand its scale and presence for strategic consulting.Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. NTT DATA will need to continue to invest and educate the market to overcome these challenges.		
Value Chain Coverage:											
Strategic Advisory											
Prototype development											
Production build											
System Integration											
Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance	
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting	
Blockchain practice overview				Blockchain platform and technology capability				Blockchain ecosystem and partnerships			
<ul style="list-style-type: none">NTT Group invests \$2 billion in R&D of emerging technologies including blockchain140+ blockchain resources across multiple countries (Japan, US, Italy, Spain, UK, and India)Started a Blockchain Observatory for non-finance companiesIdentified 40 use cases. And has undertaken ~6 PoCs. Clients include Tokyo Marine, Shizuoka Bank, Orix, Orix bank, Global pharmaceutical company, and ABI Lab				<ul style="list-style-type: none">Expertise across multiple platforms<ul style="list-style-type: none">Public: Bitcoin, EthereumPrivate: Hyperledger Fabric, C.RDA, RippleBuilding a blockchain cloud platform that enables creation of assets to develop and prototype in a fast way. Blockchain assets already developed include Cryptocurrencies wallets, Blockchain Cloud nodes, and Timestamping serviceWorkchain (R&D Initiative): Creating accelerators for deploying and benchmarking blockchain platforms, smart contract management and testing of blockchain deployments				<ul style="list-style-type: none">Founding member of Hyperledger and LyraPartnerships with blockchain frameworks, technology providers, start-ups, academicians, legal firms, consortiums such as Hyperledger, Consensys, Inzhoop, Bitstop, Spidchain, Stampery, Politecnico Milano, Universita Della Calabria			

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights		Strengths						Challenges			
<ul style="list-style-type: none">• Global team with experience across value chain• Strong BFSI client base• Clear articulation of value proposition• Strong in-house technology platforms		<ul style="list-style-type: none">• Strategy, design, and execution services focused on ROI. Clearly defined set of end-to-end offerings to help clients through the blockchain journey including research and knowledge services, marketplace strategy, organizational readiness, and execution support.• Vulcan, PwC’s in-house digital asset platform. The in-house cloud based blockchain platform enables PwC to develop new digital currency related products and services such as digital asset wallets, international payment processing, and investment and trading services. PwC also plans to offer point-of-sale and merchant services in future.• Strong base in financial services: PWC leverages its organization wide expertise in financial services (technology, business, and regulatory experts) to deliver blockchain use cases such as trade finance, syndicated loans, re-insurance, collateral management, funds governance, and mortgage origination.						<ul style="list-style-type: none">• Integrating blockchain with AI, IoT, and security capabilities. With more critical data gets stored in distributed ledgers, there is a growing need for sophisticated analysis methods including applications of AI. Use cases for IoT leveraging blockchain are also increasing across verticals where security is a big concern for connected network.• Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. PwC will need to continue to invest and educate the market to overcome these challenges.			
Value Chain Coverage:											
Strategic advisory											
Prototype development											
Production build											
System Integration											
Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Retail
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance	
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting	
Blockchain practice overview			Blockchain platform and technology capability					Blockchain ecosystem and partnerships			
<ul style="list-style-type: none">• Global team of technology, business, and regulatory experts focused on Blockchain• Clients include Asian financial services conglomerate, global technology firm, large asset management firm, and UK central bank			<ul style="list-style-type: none">• PwC’s Vulcan is a digital asset platform using digital currency technology. Vulcan potentially offers clients mobile wallets, KYC/AML passed identity management, and merchant/POS payment services across multiple currency classes including central bank money, commercial bank money, company rewards, and community currency• PwC’s DeNovo Platform is a real-time subscription based platform for clients to learn about blockchain-specific content and insights					<ul style="list-style-type: none">• Partnerships with blockchain frameworks, technology providers, start-ups, academicians, legal firms, consortiums such as Blockstream, Eris Industries, Microsoft			

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Platform-based approach with a vision for end-to-end blockchain services across industries backed by robust ecosystem

Blueprint Leading Highlights		Strengths								Challenges			
<ul style="list-style-type: none">Strong technical capabilityRobust platform and solution acceleratorsEnd-to-end go-to-market visionMarket development initiativesRobust ecosystem		<ul style="list-style-type: none">Platform strategy. In collaboration with partners, TCS aims to provide federated platform networks integrating both public and private blockchain platforms operated by various providers. TCS also leverages its blockchain/DLT platforms in specific customer situations to provide blockchain/DLT infrastructure, platform and application management as a service.Technical competency. Pool of skilled blockchain resources. Leveraging its digital learning and development platform, iEvolve, to scale the training of blockchain. Strong technical capabilities on multiple blockchain and other decentralized platforms and ability to integrate these into existing infrastructure and TCS' proprietary solutionsTechnology agnostic approach. TCS is following a multiplatform (Ethereum, Hyperledger Fabric, Corda, Monax, BigChainDB, IPFS, Ripple) strategy for its clients engagements and leveraging IBM Bluemix, Microsoft Azure, and in-house DLT platforms to provide blockchain as a service.Market development. TCS is involved in Object Management Group & Industrial Internet Consortium and participation in other blockchain consortia to create the necessary methods, messaging formats, software interfaces, and tools-related standards for the blockchain market.Robust ecosystem. TCS has a strong partnership ecosystem with emerging blockchain companies, platforms, consortia and academia under its COIN (Co-Innovation Network) including IBM Bluemix, Monax, Ascribe/BigchainDB, Zcash, Airbitz Consensys, ENT, Factom, Ericsson/Guardtime and MIT Media Lab. It is co-maintainer of the incubation project Hyperledger Burrow and is considering to join the Hyperledger, Decentralized Identity Foundation, Trusted IoT Alliance, Enterprise Ethereum Alliance, and IC3.								<ul style="list-style-type: none">Going beyond PoCs. TCS' experiences thus far are in PoC and Pilot stage. While there is an overall market adoption challenge given the nascency of blockchain, the ability to support a client through to production is fast emerging as a clear differentiator. TCS is in the process of implementing blockchain at enterprise scale for its internal TCS processes and is also embedding blockchain capabilities into TCS BaNCS suite of solutions.Scaling up blockchain Practice: TCS has a broad end-to-end vision for blockchain services and has started to aggressively invest. It would have to continue with such investments for rapid scaling up.Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. TCS will need to continue to invest and educate the market to overcome these challenges.			
Value Chain Coverage:													
Strategic advisory													
Prototype development													
Production build													
System Integration													
Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Retail, Electronics		
	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance			
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting			
Blockchain practice overview				Blockchain platform and technology capability				Blockchain ecosystem and partnerships					
<ul style="list-style-type: none">TCS has more than 250+ people focused on blockchain technology across the organization with dedicated 100+ business and technology consultants in its newly formed blockchain practiceA dedicated blockchain services practice working with multiple verticals; comprises domain and functional consultants, blockchain architects, blockchain developers, blockchain integration architects and front end developersCompleted 40+ PoCs across industries including manufacturing, BFSI, telecom, etc.				<ul style="list-style-type: none">TCS' blockchain platform expertise include Ethereum, Hyperledger, MONAX. Corda, IPFX, Ripple, BigChain DB among othersTCS' blockchain solutions portfolio includes:<ul style="list-style-type: none">TCS Enterprise DLT Platform: Blockchain platform primarily for financial servicesTCS Quartz Product: Blockchain integration solutions with banking applicationsTCS PoC Platform: Rapid PoC development platform across domains				<ul style="list-style-type: none">Partners with IBM Bluemix, Monax, Microsoft Azure, Intel, Ascribe/BigchainDB, Zcash, Airbitz, Consensys, Enigma, ENT, Factom, and Ericsson/GuardtimeConsortia memberships: Co-maintainer of the incubation project Hyperledger Burrow and is considering joining Hyperledger, Decentralized Identity Foundation, Trusted IoT Alliance, Enterprise Ethereum Alliance, and IC3Member of MIT Media Lab and has been working with its Digital Currency Initiative					

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> Breadth of coverage Technical capability IP-driven GTM Ability to drive adoption beyond POCs 	<ul style="list-style-type: none"> Strong technical capability: Tech Mahindra has capabilities across the blockchain technology aspects including platform, integration and infrastructure. Its associations with leading platform providers and emerging blockchain companies also help it to develop niche/use case specific solutions. Broad industry and use case coverage: Tech Mahindra has built several use case specific tools and solutions that include industry business process specific blockchain capabilities. Tools cover a variety of industries including BFS, manufacturing, public sector, and healthcare for a number of use cases such as cross-border payments, warranty service, audit trail (compliance), land registry, supply chain, provenance tracking among others IP-driven go-to-market: Tech Mahindra's plan is to take blockchain to the market by creating marketplace model (owning the IP) and leveraging a Platform-as-a-Service (PaaS) model. It is also investing in IoT + blockchain solutions with clients in areas such as supply chain Going beyond PoCs. While there is an overall market adoption challenge, the ability to support a client through to production is fast emerging as a clear differentiator. A few of Tech Mahindra's PoCs have already moved to production deployment. For example, Tech Mahindra is implementing cross-border payments and IT Audit trail on blockchain for a leading Indian public sector bank 	<ul style="list-style-type: none"> Strategic and Business Consulting: Tech Mahindra has strong technical capabilities but has the opportunity to further develop upfront strategic advisory services related to opportunity identification, business case development, platform selection, and roadmap definition, and change management Ecosystem development. Tech Mahindra has strong technology partnerships and experience across multiple blockchain platforms but could potentially expand its ecosystem through partnerships with relevant academia and industry consortia who will have an important role to play in maturing the blockchain space Enterprise adoption challenges. Lack of regulations and standards, interoperability challenges, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. Tech Mahindra will need to continue to invest and educate the market to overcome these challenges

Value Chain Coverage:

Strategic advisory

Prototype development

Production build

System Integration

Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> 10+ PoCs delivered with around 20+ live conversations for blockchain engagements Resource capability includes SMEs, technical architects, chaincode developers, UI and UX resources and dedicated blockchain program managers Some of the PoCs have moved to production including for a leading public sector bank in India 	<ul style="list-style-type: none"> Experience across Hyperledger Fabric, Ethereum, and few other niche platforms offered by sector/solution specific Fintechs The blockchain solutions portfolio of Tech Mahindra includes cross-border payments, warranty service, audit trail (compliance), land registry, supply chain, provenance tracking, loyalty and rewards, public distribution system among others 	<ul style="list-style-type: none"> Partnerships IBM (platinum partner), Ethereum, Hyperledger, BlockApps, Sofocle, AlphaPoint Participant of the core group for blockchain platform build out – set up by the Institute for Development and Research in Banking Technology (IDRBT), a Reserve Bank of India undertaking

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> In-house tools Contribution to market development Intellectual property 	<ul style="list-style-type: none"> Sandbox environment. Virtusa has developed a cloud-based sandbox environment for rapid blockchain deployment. It supports 8+ blockchain platforms connects to leading CRM and ERP systems. The sandbox has 15+ solution templates built onto the platform and also helps to convert idea to an MVP in 3-4 weeks time. Its accelerator solutions include 100+ precompiled use cases across different sectors. Integrating blockchain with other emerging technologies. Virtusa identifies the need for integration of other digital technologies with blockchain for greater business value realization. It is already working on cross-vertical applications of blockchain for digital transformation. For example, it created an auto-lending marketplace for an Australian company using three technologies: algorithmic lending, blockchain, and IoT. Market development initiatives. Virtusa participates in ISO/TC 307 related to standardization of blockchain and distributed ledger technologies. It has established Blockchain Exploratory Center to focus blockchain innovation and client engagements. Virtusa has initiated a in-house 4-week training program for its resources to help meet the increasing demand for skilled technical workforce trained in blockchain. Coverage beyond BFS. Virtusa is expanding beyond BFS and is in active conversations with insurance, media, healthcare and life sciences clients. Security and privacy specialization. Virtusa's is focused around developing solutions around Blockchain security concerns since not all parts of the contract can be revealed to in public. 	<ul style="list-style-type: none"> Going beyond PoCs. Virtusa's experiences thus far is in PoC/Pilot stage. While there is an overall market adoption challenge, the ability to support a client through to production is fast emerging as a clear differentiator. End-to-end service offering. Clients rely on Virtusa primarily for its technical capability to develop PoCs. While Virtusa is starting to provide advisory services (e.g., Blockchain Use Case Evaluation Framework to identify the right use cases for desired business outcome), there is an opportunity to further expand its scale and presence for strategic consulting. Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. Virtusa will need to continue to invest and educate the market to overcome these challenges.

Value Chain Coverage:

Strategic advisory
Prototype development
Production build
System integration

Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Micro-finance / Micro-insurance
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> 20+ clients (12+ BFS and 8+ non-BFS) Built blockchain Exploratory Center for blockchain related research and testing purposes Clients include Australian bank, Nordic bank, and US banking organization, among others 	<ul style="list-style-type: none"> Supports eight different blockchain platforms including Hyperledger, Ethereum, Corda, Chain, Quorum Built cloud-based sandbox environment for 100+ pre-compiled blockchain use cases 15+ solution templates in the areas of payment, credit monitoring, check fraud management, trade finance, OTC derivatives, interest rate swaps, covenant management 	<ul style="list-style-type: none"> Partnerships with MultiChain, Hyperledger, Ethereum, Corda, ChromaWay, Chain, Ripple, Coins.ph, Kelisec, Distributed ID Research covering 400+ start-ups across different sectors

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights

- **Technology agnostic approach**
- **Domain expertise**
- **Long-standing partnerships**

Value Chain Coverage:

Strategic advisory

Prototype development

Production build

System Integration

Strengths

- **Deep industry knowledge** across industry verticals through DXC products, services, and client relationships.
- **No bias to any one blockchain platform.** Working on both Hyperledger Fabric as well as Ethereum private blockchains for development and PoCs to remain unbiased and flexible at this early stage of maturity of blockchain platforms.
- **Strong and long running partnerships** with IBM for blockchain aaS on Bluemix and Microsoft blockchain aaS on Azure. Operations support for on-premise private blockchain deployments.

Challenges

- **Scaling up blockchain practice:** DXC blockchain practice is an early stage of evolution and is closely watching the ongoing blockchain technology development.
- **Expanding the ecosystem.** While DXC has strong relationships with IBM and Microsoft, it will require broader ecosystem across industry consortia, blockchain platforms, start-ups, and academia to provide collaborative solutions to its clients.
- **Coverage beyond BFSI.** DXC is primarily focused on BFSI from a blockchain perspective but the market opportunity for use of blockchain technology beyond financial services is exploding in verticals such as manufacturing, healthcare, telecom, and others.

Industry coverage

Manufacturing

Life sciences

Healthcare

Financial services

Professional services**

Insurance

Travel and hospitality

Telecom and media

Energy and utilities

Public sector

Blockchain practice overview

- Leverage existing client relationships to include blockchain engagements
- Extend DXC product portfolio with blockchain capabilities

Blockchain platform and technology capability

- DXC's blockchain platform expertise include Hyperledger Fabric, Ethereum, and Corda

Blockchain ecosystem and partnerships

- Partnerships with IBM for Blockchain As-a-Service on Bluemix and Microsoft Blockchain As-a-Service on Azure

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> Years of experience Technical capability Platform agnostic approach 	<ul style="list-style-type: none"> Multi-year experience with blockchain. Luxoft has been involved in blockchain and DLT technologies for several years and is actively involved in organizations such as Crypto Valley, which is helping to promote and shape the direction people are taking this technology. Integrating blockchain with emerging digital technologies. Blockchain is a part of Luxoft Digital organization's remit, the part of the company that specializes in taking new technologies to market Platform agnostic. Luxoft uses a mix of platforms - depending on the needs of the client. While it remains platform agnostic, it has its deepest knowledge on the larger platforms, such as Ethereum. 	<ul style="list-style-type: none"> Scaling up blockchain practice. Luxoft's blockchain practice is an early stage of evolution and is closely watching the ongoing blockchain technology development. Expanding the ecosystem. While Luxoft has started to establish partnerships in the blockchain space, it will require broader ecosystem across industry consortia, blockchain platforms, start-ups, and academia to provide collaborative solutions to its clients. Use case and industry coverage. Luxoft has delivered four POCs across BFS, healthcare, and logistics. The market opportunity for use of blockchain technology is exploding across verticals such as manufacturing, insurance, telecom, public sector, and others.

Value Chain Coverage:

Strategic advisory

Prototype development

Production build

System integration

Industry coverage

Manufacturing

Life sciences

Healthcare

Financial services

Professional services**

Insurance

Travel and hospitality

Telecom and media

Energy and utilities

Public sector

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> Blockchain practice is a part of Luxoft Digital Organization; it has delivered four client PoCs 	<ul style="list-style-type: none"> Luxoft remains platform agnostic but it has deep knowledge on the larger platforms such as Ethereum 	<ul style="list-style-type: none"> Partnerships with Sovrin, Consensus, Ethereum Active involvement with Crypto Valley

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Persistent Systems

Leveraging product engineering DNA and strong in-house talent to deliver blockchain solutions



Blueprint Leading Highlights	Strengths	Challenges
<ul style="list-style-type: none"> • Technical capability • In-house talent 	<ul style="list-style-type: none"> • Product engineering DNA. Product engineering and software development capabilities potentially allows persistent to delivering on the promise of blockchain. It has developed hands-on expertise on multiple leading platforms. • Combination of consulting and implementation services. Persistent's go-to-market is centered around strategy consulting (blockchain business case, platform selection) and implementation services (solution design, PoC creation). • Integrating blockchain with other emerging technologies. Persistent is leveraging blockchain in its digital IP such as Patient-360, a patient-centric healthcare delivery and patient experience approach which can be complemented with blockchain enabled control of patient data and secure, streamlined sharing across physicians and hospitals. • In-house talent development. Persistent has incubated blockchain specific development teams within across business units, being trained on technologies such as Hyperledger and Ethereum. Also it has developed specific training content curving out from clients' use cases and ongoing internal training to scale its blockchain expertise. 	<ul style="list-style-type: none"> • Solution maturity. Most of Persistent's experience thus far are in exploration or POC stage. While there is an overall market adoption challenge, the ability to support a client through to production is fast emerging as a clear differentiator. • Partnership ecosystem. While Persistent is investing in developing in-house blockchain talent, it has no formal partnerships in the space. It will require broader ecosystem across industry consortia, blockchain platforms, start-ups, and academia to provide collaborative solutions to its clients. • Coverage beyond BFS. While Persistent has started to focus on verticals such as healthcare and supply chain, its primary focus continues to be BFS from a blockchain perspective. The market opportunity for use of blockchain technology beyond financial services is exploding in other verticals such as manufacturing, healthcare, telecom and others • Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. Persistent will need to continue to invest and educate the market to overcome these challenges.

Value Chain Coverage:

Strategic advisory

Prototype development

Production build

System Integration

Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance
	Claims processing and payment	Identity	Security	Anti-counterfeiting	Provenance, track and trace	Master patient index	Longitudinal health records	Clinical trials	Title records and ownership recording	Voting

Blockchain practice overview	Blockchain platform and technology capability	Blockchain ecosystem and partnerships
<ul style="list-style-type: none"> • Built blockchain innovation lab anchored in Corporate CTO organization • Completed 12+ PoCs for clients including North American financial services company 	<ul style="list-style-type: none"> • Experience across Hyperledger, Ethereum, Corda • Solutions and PoCs are built in the areas of international payments, commercial paper, autonomous self-service, and KYC among others 	<ul style="list-style-type: none"> • Persistent Systems has no official partnership in blockchain and is largely focused on developing in-house talent

**Professional Services industry coverage includes auditing, accounting, legal, real-estate, etc.

Blueprint Leading Highlights		Strengths					Challenges				
<ul style="list-style-type: none">• Technology agnostic approach• Consulting and technical capabilities• Client experience in Europe		<ul style="list-style-type: none">• Strong client engagements.<ul style="list-style-type: none">• Technical lead partner of DECODE (Decentralized Citizens Owned Data Ecosystem), a three year multidisciplinary project with 14 consortium members funded by the EU for citizen data privacy. Pilot phase likely to start in early 2018.• Argent is a cross-border and cross-currency international payments and settlement platform leveraging distributed ledger technology and shared operational infrastructure. It offers the following features.• Multi-platform expertise. ThoughtWorks has experimented with a number of blockchain platforms including Ethereum, Hyperledger Fabric, R3 Corda and Chain in exploring potential use case solutions.					<ul style="list-style-type: none">• No specific blockchain offering. But, ThoughtWorks is actively evangelizing with its clients for use of blockchain technology, especially in situations where we see blockchain as a good fit.• Partnership ecosystem. ThoughtWorks is leveraging its in-house talent and experience to work with different blockchain platforms. However, an ecosystem approach is evolving in the market that drives collaboration across industry consortia, start-ups, academia, technology providers, and blockchain platforms.• Lack of overall investments in blockchain. While ThoughtWorks has made efforts to develop blockchain thought-leadership, it has made limited investments in building blockchain-related IP or solutions.• Enterprise adoption challenges. Lack of regulations and standards, talent crunch, security concerns, and overall market nascency are key inhibitors of enterprise adoption. ThoughtWorks will need to continue to invest and educate the market to overcome these challenges.				
Value Chain Coverage:											
Strategic advisory											
Prototype development											
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Industry coverage	Manufacturing	Life sciences	Healthcare	Financial services	Professional services**	Insurance	Travel and hospitality	Telecom and media	Energy and utilities	Public sector	Retail and CPG
Use cases	Wallets	Auditing	Compliance	Asset management	Trading	Payments and settlements	Lending	Investing	Trade finance	Microfinance	
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Blockchain practice overview				Blockchain platform and technology capability				Blockchain ecosystem and partnerships			
<ul style="list-style-type: none">• ThoughtWorks is invested in building internal capabilities and ecosystem along with actively evangelizing with clients				<ul style="list-style-type: none">• ThoughtWorks remains platform agnostic but it has experience on the larger platforms such as Ethereum, Hyperledger Fabric, and R3 Corda				<ul style="list-style-type: none">• Partnering with a digital database technology company in UK to develop parts of their distributed ledger system. This solution is being developed collaboratively with some major international banks.• Actively looking at partnering with early adopters in the Indian ecosystem			

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Market Predictions



Blockchain Services Predictions

What to expect in the next one to two years

- The enterprise blockchain services market will double to nearly US \$1 billion in 2018-2019
- Universal awareness of blockchain will increase, which would make easier for blockchain providers to make early steps in to customer ecosystem.
- More Financial Services use cases will move into production. A potential slowing of VC investment and shakeout of some of the less suitable use cases. FS use cases will start to focus around fewer large consortia.
- We will see explosive growth in non-BFS use cases, especially in supply chain, manufacturing, healthcare, insurance, energy and utilities, and public sector.
- Several POCs will migrate into production, though movement to production will continue to be very measured, scrutinized, and monitored. Some of the broader consortia plays will see the light of day with trials into industry-wide solutions and platforms.
- We'll see further clarity on standards and regulations as well as legal position around smart contracts and consensus mechanisms.
- Integrated solutions will emerge with blockchain woven with AI and IoT. Blockchain will start to drive the IoT economy with smart contracts with minimal human intervention.
- Improved regulatory clarification of how blockchain solutions should be handled though maturity will vary by geographies.
- More mainstream central banks will start to explore the use of digital currencies.
- There will be a significant growth in demand for blockchain engineers.

Blockchain Services Predictions

What to expect in the next three to five years

- Services and products based on blockchain offered by large companies or big consortia on a large scale.
- Emergence of blockchain-driven ecosystems and decentralized autonomous entities that could disrupt industrial economics in certain sectors.
- As blockchain matures, existing business models will get disrupted, initially with private blockchains and over-time with public blockchains.
- Platform consolidation as some platforms will fade away and blockchain networks start to become more inter-operable.
- ICOs will become an alternative not only for financing blockchain startups but also startups in general.
- Emergence of industry-specific consortiums to standardize blockchain governance, platforms, etc. per business areas.
- Most successful startups will be acquired by large companies.

About HfS



Saurabh Gupta

Chief Strategy Officer, HfS Research



Saurabh Gupta is Chief Strategy Officer at HfS. He oversees HfS' global research function managing the global team of analysts across US, Europe, and Asia-Pac. He works closely with the CEO to set the strategic research focus and agenda for HfS Research, understanding and predicting the needs of the industry and ensuring that HfS maintains its position as the strongest impact thought leader for business operations and services research.

He is a recognized thought leader and passionate problem solver in the global services industry. With 15+ years of experience across client, provider, advisory, and analyst roles, he brings a uniquely realistic and wide-ranging perspective to our industry's challenges and opportunities. Before joining HfS, Saurabh led strategy for Genpact's CFO and transformation services, helped shape the Business Process Services (BPS) strategy for AbbVie, managed Everest Group's global BPS practice, and worked as a techno-functional consultant at Infosys.

Saurabh advises senior executives on business transformation initiatives with a strategic mindset and execution orientation. He has authored over 125 research reports, is a frequent speaker, and is regularly quoted in industry publications. He is well-known for spotting disruptive trends like As-a- Service, Cloud, Analytics, Robotics and predicting their implications for different stakeholders. He brings to the table a combination of subject matter expertise and structured thinking with effective collaboration and communications. Saurabh is a Mechanical Engineer from Delhi College of Engineering and MBA from IIT Bombay.

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Tanmoy Mondal is a Knowledge Analyst at HfS Research, identifying global trends in engineering services from both industry & technology perspectives, tracking global outsourcing deals & investments including partnership agreements & R&D announcements in the sector and supporting the domain leads in secondary research, data analysis, PoV's and research writing.

Tanmoy has over 4 years of research, pre-sales and market intelligence experience in TCS, HCL and Tracxn. At his TCS and HCL role, he worked on preparing RFP responses including solution construct and commercial proposition. He was responsible for analyzing the business scenario for ERP implementation for different industry verticals and participated in several Enterprise Transformation projects across domains to optimize the IT landscape, increasing IT integration among client business verticals, improving productivity and reducing business incidents. At Tracxn, he was part of the emerging technology team that helped finding companies (start-ups) specializing in upcoming technologies (virtual/augmented reality, drone etc.) for acquisition and portfolio investments for PE and VC firms.

Tanmoy holds a Master's in Business Administration from IIFT (Indian Institute of Foreign Trade), and Bachelor of Engineering from Jadavpur University, Kolkata.

Tanmoy is passionate about football and loves to read economics related books and articles.

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The HfS Mission: Revolutionizing the Industry

HfS' mission is to provide visionary insight into the major innovations impacting business operations: automation, artificial intelligence, blockchain, digital business models and smart analytics. We focus on the future of operations across key industries. We influence the strategies of enterprise customers to develop operational backbones to stay competitive and partner with capable services providers, technology suppliers, and third party advisors.

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- 3000 enterprise customer interviews annually across the Global 2000.
- A highly experienced analyst team.
- Unrivalled industry summits.
- Comprehensive data products on the future of operations and IT services across industries.
- A growing readership of over one million annually.

"[The As-a-Service Economy](#)" and "[OneOffice™](#)" are revolutionizing the industry.