



THE HFS BLUEPRINT GUIDE TO EMERGING BLOCKCHAIN SERVICES IN BFSI

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WHAT YOU NEED TO KNOW ABOUT BLOCKCHAIN AND BLOCKCHAIN SERVICES IN BFSI

Blockchain is the technology that allows companies to create, validate, and transact digital assets. More tactically, it's a database of groups of transactions (blocks) that are linked to the previous set of transactions (the chain) and is replicated and distributed to everyone who participates in the network so that all copies of the database are identical. Blockchain records every transaction that ever happens, and no records are ever deleted. Currently, blockchain is most commonly used for financial transactions but can be used for any asset that can be digitized.

Companies can use blockchain to trade digital assets with other players while instantaneously validating the identity of both parties in the peer network. The blockchain validates the asset and partner identity in seconds via this peer network of identical data sets, also referred to as distributed ledgers.

The peer network can be "permissionless," meaning anyone can join—similar to the Bitcoin network. Other networks require permission to join. In a permissioned network, every participating member is identified and validated before being allowed to join. The validation process to join a network varies based on who is leading the initiative to create the network and the network's purpose. A common scenario is a set of banks that already work together and are known to each other. They agree to participate in a permissioned network. This approach also ensures that all parties can be held accountable according to laws and regulations.

Blockchain is very new for enterprises, and it has shown applicability in the Internet of Things (IoT), supply chain, and financial transactions. However, the vast majority of work at the moment is happening in the financial services



industry. Financial services firms are experimenting primarily with permissioned networks to reduce transaction times, decrease fraud, and best manage compliance and security.

A typical blockchain transaction works roughly in this way:

1. **Transaction initiation:** One party (the sender) creates a transaction and transmits it to the network. The transaction message includes details of the receiver's public address, the value of the transaction, and a cryptographic digital signature that proves the authenticity of the transaction.
2. **Transaction authentication:** The nodes (computers/users) of the peer network receive the message and authenticate its validity by decrypting the digital signature. The authenticated transaction is placed in a "pool" of pending transactions.
3. **Block creation:** Pending transactions are put together in an updated version of the ledger, called a block, by one of the nodes in the network. At a specific timing interval, the node broadcasts the block to the network for validation.
4. **Block validation:** The validator nodes of the network receive the proposed block and work to validate it through an iterative process that requires consensus from the majority of the network. In essence, because all parties have the same data set, they validate by ensuring the information matches their ledgers. Different blockchain networks use different validation techniques. Given that the validation happens across multiple peers in the network compare the information to their own data sets, fraudulent transactions are nearly impossible. (With increasingly sophisticated threat techniques, we hesitate to say unhackable although for the moment blocks and the transactions are considered unhackable.)
5. **Block chaining:** If all transactions are validated, the new block is "chained" into the blockchain, and the new current state of the ledger is broadcast to the network. This whole process can be completed within 3–15 seconds.

Although there are non-financial examples of blockchain use cases, such as validating the authenticity of physical products (for example, VIN numbers for cars), the bulk of the opportunities and interest today is in the financial services industry, especially banking, capital markets, and insurance. This report focuses specifically on BFSI for this reason.

The market is so new that during our study, most providers pointed to proof-of-concept (PoC) engagements with clients rather than to any larger implementations. The services market for this new technology is just taking shape, and testing its commercial viability. Academic institutions are beginning to research blockchain and its potential as well. We spoke with Mary Lacity, Curators' Distinguished Professor at the University of Missouri – St. Louis, and Roman Beck, Head of Information Management Section at IT University of Copenhagen, to get their insights.

At this point, if you're just "kicking the tires," you're not lagging your peers, but you really must start initial investigations now so you can understand what your options are as the market matures. The purpose of this



Blueprint Guide is to help buyers think through potential ways to use blockchain today and to give a preliminary overview of service providers we see offering blockchain-enabled services.

What to Watch in Blockchain Services

In our blockchain research, we found:

- » A fascinating irony in blockchain services. Despite the basic foundational premise that blockchain is about peer-to-peer networks, no suppliers mentioned any multi-client engagements. This could be for multiple reasons, especially the lack of leading-edge clients willing to collaborate openly with such new technology. However, it does seem awkward to position individual offerings as the primary vehicle without describing in more depth how that individual client's engagement plugs into a public or permissioned network. All collaborative efforts appear to be industry consortia, such as R3CEV, which includes more than 50 global banks.
- » Related to the peer-to-peer aspect, don't expect the same debate about public and private networks we saw in early cloud solutions. For financial services institutions at least, it looks like permissioned networks will be the way forward. Companies are experimenting without trading partner involvement, although there are examples of PoCs where the network is made up of all intra-company nodes used for transferring and tracing assets among different business units.
- » The economics of blockchain are murky. Although each participant pays for its own engagement, the question of economics becomes more important as the blockchain scales. For example, being in the network means having the same copy of the entire data set as everyone else. As the blockchain scales, clients will have to pay for the storage and compute power required. If the client chooses not to use a cloud-based infrastructure for its blockchain effort, there are associated hardware costs. The size of the blocks and the validation method used by different applications and networks also affect the speed and cost of transactions. The more thorough the validation method, the most expensive it is to validate a transaction.
- » Security efforts, governance, and regulatory compliance aren't keeping up with blockchain's potential. Although blockchain generally provides good security, there are ways to attack, and hackers are getting more sophisticated. Therefore, it's highly possible that new threats to blockchain security will emerge. It's also unclear whether regulatory bodies have concerns about shared information, even if it's encrypted. Services firms will need to spend more time educating potential clients about the governance, risk, compliance, and security issues.

Tips for Buying When You're Not Sure *What You're Buying*

Most of the client examples provided by the suppliers we surveyed are proof-of-concept projects, which makes sense given how quickly blockchain is emerging as a technology. However, don't confuse proof of concepts and



experimentation with the notion that nothing real is happening. Buyers need to dig into what's possible from a business model perspective, from a technology perspective, and from a legal/regulatory perspective. The question "what's possible?" won't be answered quickly or easily, so experimentation is a viable option right now. But it does beg the question, if a buyer wants to explore blockchain but doesn't have a specific goal or outcome in mind (essentially if you want to experiment and therefore aren't buying a specific outcome or business result), how do you actually procure it, and what exactly are you procuring? Buyers who want to experiment with a blockchain engagement should do the following:

- » **Evaluate blockchain together with trading partners/suppliers.** For example, would your supplier let you pay their fee using blockchain? Find out which other third parties you can team up with, especially if you're looking at starting a private blockchain. Everyone will have to collaborate, so it's best to start exploring together.
- » **Make blockchain engagements separate from any current BPO or ITO activities.** Embedding new blockchain work in existing engagements can become complicated and unnecessarily frustrating. Instead, create separate projects that can be isolated and evaluated separately. It might be tempting to use your outsourcing contract's bank of project hours for something like this, but you won't get the right focus or talent. Start your blockchain engagement from scratch, even if you're leveraging a master service agreement for the underlying commercial aspects.
- » **Tell your current service provider partners that you're investigating blockchain.** Hopefully, you have a mechanism in your relationships through which you share corporate goals and initiatives, your partners brief you on their investments and emerging opportunities, and you discuss solutions relevant to your business. Explore your interest in blockchain with your providers. As much as service providers get a reputation for not being innovative in existing engagements, clients also need to be open and willing to explore new ideas.
- » **Set up "daydream" sessions to create scenarios for using blockchain.** Brainstorming isn't really free since it costs the (expensive) time of senior people, but it's worth hosting a short session to dig into which problems can be solved by blockchain and which opportunities the organization could create using the technology. Do this after you get insights and ideas from your providers. Design thinking workshops are an option here as well; many service providers have acquired and developed this capability for human-centered problem finding and solving.
- » **Consider funding an experimentation pool.** Instead of starting with a traditional engagement to "build something" or do a formal proof of concept, consider setting aside a small amount of money for experimentation. What constitutes an experiment? Perhaps you saw an article on how one company was using blockchain and you want to see if you can replicate it. Or maybe you'd like some of your internal staff to start researching and learning to use the actual technology.
- » **Start researching risk and compliance related to shared data environments.** Given that everyone has a copy of the same "ledger," start to read up on how regulatory bodies and the government are thinking about



blockchain. For example, if someone in the network is using the system illegally, do the other parties somehow share in the blame if their servers have copies of the illegal transactions? What about data breaches? The blockchain itself may be difficult to hack, but individual wallets and accounts are hackable.

What Is Happening in Blockchain in BFSI? Experiments

The market for blockchain is nascent. Some technology suppliers offer blockchain technology and applications built on blockchain, although the pool of these vendors is still small. We have observed that many providers work with the same set of software vendors. In our research into software vendors and from providers' responses, we've found the following are some of the prominent applications of blockchain technology today (see Exhibit 1).

EXHIBIT 1: EXAMPLES OF BFSI'S MOST COMMON BLOCKCHAIN APPLICATIONS

Application Area	Software Vendor Partners of the Services Firms We Surveyed
Smart Contracts	Ethereum, Mirror, Symbiont
Record Keeping	Factom, Tierion
Asset Management	Chain, WAVE
Trading	Digital Asset Holdings, Hyperledger, Digital Tangible Trust, OpenLedger
Payment and Settlement	Ripple, Ciphrex, SETL
Distributed Identity	Civic Technologies, Keybase
Lending and Investing	BTCJam, Bitbond, Grayscale
Risk Management Solutions	Elliptic, Chainalysis
Wallet	Coinbase
Blockchain Security	Guardtime, BitGo, BitFury

Source: HfS Research, 2016



Emerging Blockchain Services Market Grid

Given the newness in this space, we aren't ready to do a full Blueprint yet. However, we do have a perspective on where the suppliers stand and how they're positioned for future success. To give you a picture of how HfS sees the market landscape at the moment, we looked at two primary areas:

Execution

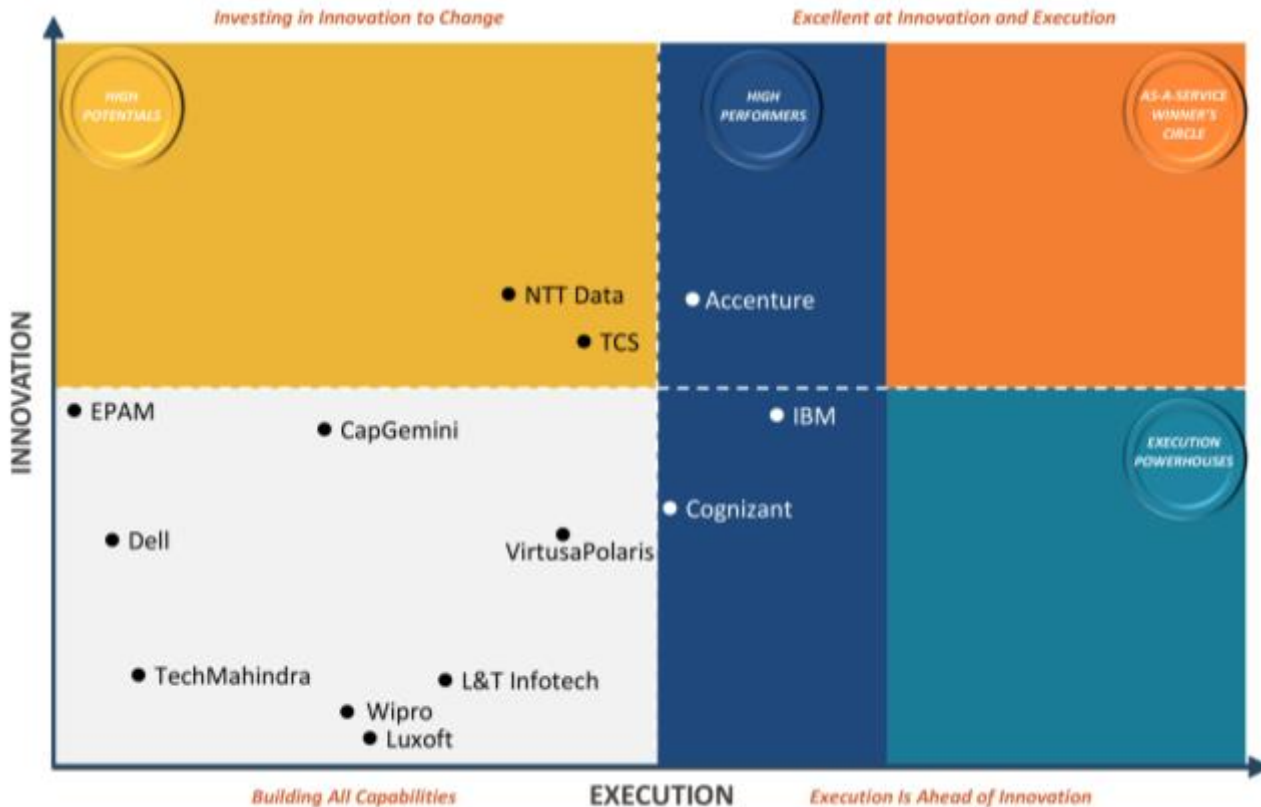
- » **Skin in the game:** R&D, investment, and financial commitment to blockchain. We're looking for more than a few white papers and press releases. We're evaluating the existence of technology labs, code bases, blockchain-based applications and products, solution sets, and other evidence that the service provider is building capability and is committed to the space.
- » **Named clients:** We certainly want to know about case studies and use cases regardless of whether the clients are anonymous. However, the existence of clients that are willing to be referenced by name shows engagements that are more mature. We also take into account the types of engagements where possible, with heavier emphasis on projects that are operating in the business over those that are exploratory.

Innovation

- » **Ability to communicate vision:** Too often, providers, especially technology vendors, get very excited about a technology and tout it as the next great disruption—while leaving it to clients to envision how that technology might be applied to their specific business problems. So we give more credibility to providers that can help explain blockchain to clients in ways that show the real potential and applicability to business over those that have more grandiose but ultimately less tangible ideas for how blockchain can be used in practice.
- » **Specificity of solutions:** Providers that offer generic "blockchain as a service" receive less credit than those that are creating more specific solutions, such as "Blockchain for Know Your Customer." Although, in all fairness, most providers are pitching the generic and the specific. However, extra credit goes to specifics.



EXHIBIT 2: HFS MARKET GRID: PRELIMINARY TAKE ON EMERGING BLOCKCHAIN SERVICES



Source: HfS Research, 2016

We think you need to see this grid as a starting point. The market is so new and capabilities are still emerging so quickly that it's impossible to say any service provider is a winner, or even a clear leader. In fact, the differences between those in the high-performer category and those in the other categories are not so large that the explorers in the lower left can't leapfrog and take a stronger position in the market. We expect many shifts to happen over the next several years as each service provider included here (and many others that we didn't include in this report) continues to evolve its perspective and skill sets in blockchain.



Mini-Profile: Early Blockchain Service Providers

Many suppliers are investigating blockchain for technical and commercial viability. Some players, such as Arvato and Leidos, are still early evaluators, while others have made more progress.

NTT DATA

Capabilities in this market	<p>NTT DATA is scaling up its blockchain capability, making investments in the enterprise and consumer segments, but especially in financial services and insurance. Focus areas include distributed transactional systems, the Internet of Individuals, the Internet of Things, etc.</p> <p>NTT DATA has blockchain-related initiatives in R&D centers in the United States, India, Italy, and Japan. The company believes the capabilities being built in these centers are becoming part of clients' core expectations.</p>
Strengths	<p>NTT DATA can tell the blockchain story at the technical level but also puts it in the context of business scenarios.</p>
Challenges	<p>NTT DATA has not referenced any specific technology partnerships, and it will want to focus on key players to bolster its market credibility further. The service provider is a member of Hyperledger and is working with Ethereum on IoT-related blockchain research.</p>
Key clients	<p>NTT DATA's clients include two major Japanese banks.</p>
Examples/results	<p>NTT DATA has done a PoC with leading Japanese banks and is exploring other use cases that focus on the application of smart contracts and blockchain applications in the supply chain.</p> <p>In addition to the case above, NTT DATA has also done another PoC specific to trade finance, donation tracking platform, management, and custody of digital identity (for Know Your Customer and PSD2).</p>
In brief	<p>Buyers can talk to NTT DATA about the business potential of blockchain, as well as technical aspects. The provider's strength in Asia can also be a factor for global buyers.</p>



WHAT TO WATCH

Blockchain will redefine what it means to share risk and reward with your supplier, and across your trading network. Shared rewards seem clear for trading partners—no intermediary to make a profit off a transaction that the peer network can do within seconds for essentially no cost. Especially in these early days of blockchain, there's a lot of intellectual property, practical use cases, and economic model testing that can be shared between suppliers and clients to make projects particularly rewarding for both parties.

The risks, however, are not as obvious yet. We all know to worry about security. However, blockchain doesn't handle security in the way other technologies do. There are different security measures for the chain because of the long list of activities like validation and events that happen in multiple places simultaneously. However, identities can still be hacked. Another risk is even more worrisome: What's the liability of the entire network for a problem with one peer? If one peer is found to be operating poorly, and since it's operating in a shared environment, are all the peers equally responsible?

We're still evaluating what a blockchain proof of concept might cost, the cost of the technologies used, etc. Look for future research on this subject. Scalability and the inability to delete anything from the blocks or the chain will also factor in, as companies begin to need more and more processing power, energy, and storage. In addition, because each party has to have its own copy of the ledger, we're not sure blockchain makes sense in a cloud infrastructure model. Companies may want to keep the ledger internally (certainly, that's what's happening today). Therefore, we also need to research the interplay of blockchain and cloud.

We do know, given all this newness and uncertainty, that you should expect to be frustrated at the lack of blockchain talent to help you. Blockchain experts are few and far between, so you are faced with higher-than-normal bill rates unless you can negotiate creatively. An example of a creative negotiation? Give the supplier some rights to use your IP after the engagement ends, give the supplier a financial incentive like a share of whatever operational costs you save for three months, or agree to allow the supplier to use your engagement as a public case study.

As we continue our research, we're building a model for what we think blockchain's evolution will look like, including which industries are adopting quickest after BFSI. It appears that PoCs will continue for at least another year, although we'll start to see more operational blockchain efforts at the intra-company level. In addition, as Roman Beck, Head of Information Management Section at IT University of Copenhagen, says, the next two years are about doing the same things cheaper and better. New opportunities, business model changes, and other innovations will begin to surface after this experimentation period.



ABOUT THE AUTHORS

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Christine Ferrusi Ross focuses on helping firms solve complex client problems by developing new service offerings and products to meet new market demands. At HfS she's working with the team to grow the successful HfS Summits program with a global remit across IT and Business Process Services.

Christine is a veteran of the IT services industry and the analyst community. She pioneered some of the industry's first research into vendor management and supplier risk, as well as building blockbuster sourcing conferences and peer communities. Christine has helped some of the largest companies in the world operationalize their sourcing strategies and supplier risk efforts.

From a domain perspective, Christine's passionate about supplier and supply chain risk, Internet of Things, democratizing big data and analytics, and—in large part thanks to her children—marketing best practices as exemplified by video game designers and Korean boy bands.

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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.

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ABOUT HFS

The Services Research Company™

HfS Research is The Services Research Company™—the leading analyst authority and global community for business operations and IT services. The firm helps enterprises validate their global operating models with world-class research and peer networking.

HfS Research coined the term *The As-a-Service Economy* to illustrate the challenges and opportunities facing enterprises that need to re-architect their operations to thrive in an age of digital disruption, while grappling with an increasingly complex global business environment. HfS created the Eight Ideals of *Being As-a-Service* as a guiding framework to help service buyers and providers address these challenges and seize the initiative.

With specific focus on the digitization of business processes, intelligent automation, and outsourcing, HfS has deep industry expertise in healthcare, life sciences, retail, manufacturing, energy, utilities, telecommunications, and financial services. HfS uses its groundbreaking *Blueprint Methodology™* to evaluate the ability of service and technology providers to innovate and execute the Eight Ideals.

HfS facilitates a thriving and dynamic global community of more than 100,000 active subscribers, which adds richness to its research. In addition, HfS holds several *Service Leaders Summits* every year, bringing together senior service buyers, providers, and technology suppliers in an intimate forum to develop collective recommendations—for the industry and to add depth to the firm's research publications and analyst offerings.

Now in its tenth year of publication, HfS Research's acclaimed blog *Horses for Sources* is the most widely read and trusted destination for unfettered collective insight, research, and open debate about sourcing industry issues and developments. *Horses for Sources* and the HfS network of sites receive more than a million web visits a year.

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