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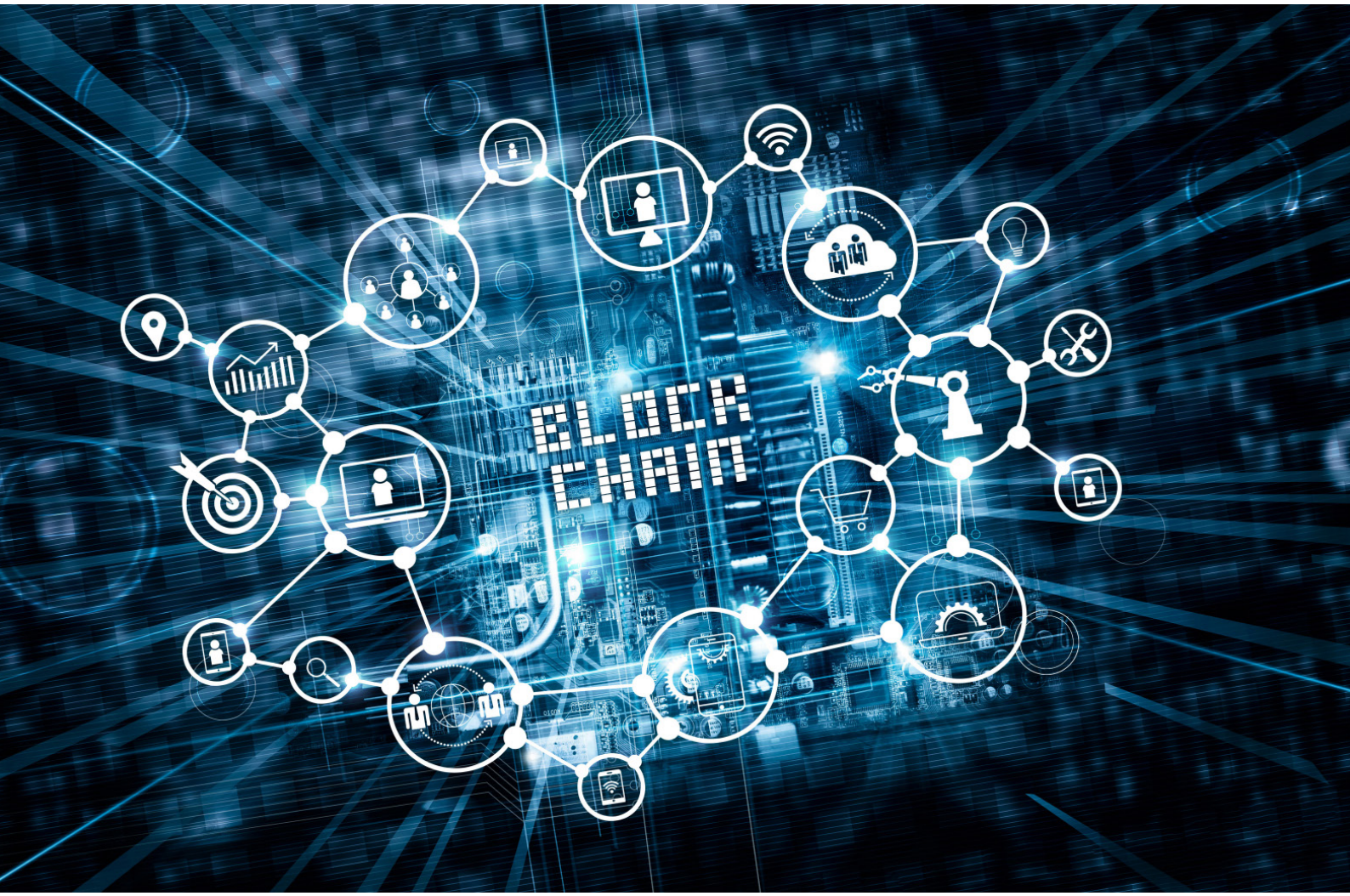
IDC Solution Spotlight

Unlocking Blockchain's Transformative Power Across Industries

August 2018 | By Simon Piff



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IDC SOLUTION SPOTLIGHT

Blockchain is fast becoming a key business disruptor, enabling organizations all over, from public sector to logistics, to lower the cost of trust while improving business processes and delivering efficiency.

Unlocking Blockchain's Transformative Power Across Industries

August 2018
Sponsored by: Samsung SDS
Written by: Simon Piff, Vice President, Blockchain and Security Research

Introduction

Blockchain is emerging beyond the cryptocurrency hype and poised to become a deep transformational agent for many industries. Blockchain, a type of distributed ledger technology (DLT), is a data store that represents a digital ledger of records (block) that are cryptographically linked (chained). The result is an immutable and sequential set of records that can be used to reduce bureaucracy and streamline processes to drive new levels of efficiency.

The growing interest and support for the technology is driven by the fact that blockchain improves transparency, trust and integrity within transactions. Early adopters see blockchain as providing first-mover advantage, giving them the ability to outperform their peers for a period of time until these solutions become more broadly adopted. The financial services industry continues to blaze the trail, taking the lead in blockchain pilot and production projects to stay ahead of digital disruption.

AT A GLANCE

KEY STATS

By 2022, the global blockchain market will grow to US$11.7 billion, from a base of US$754 million in 2018.

WHAT'S IMPORTANT

Blockchain solutions work best with multiple parties that need an automated process of delivering trust.

KEY TAKEAWAY

This technology offers first-mover advantage in many vertical markets, with returns in the areas of improved customer satisfaction as well as time and money saved.

The market still faces several challenges, but as with any emerging technology, the dust will settle. Some of the more successful blockchain solutions developed by a handful of international vendors have yielded good returns when applied in the context of a consortium, which blockchain solutions operate best in.

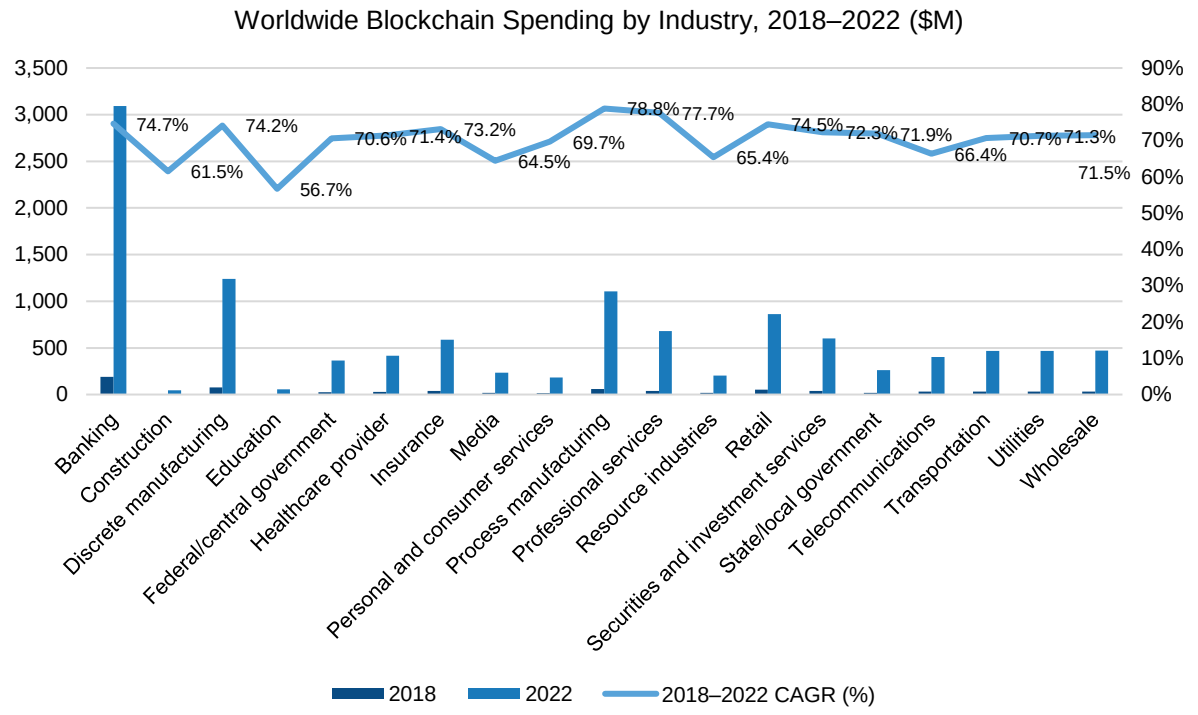
This IDC Solution Spotlight takes a closer look at the application potential of blockchain and how Samsung SDS can help organizations enhance trust in transactions for greater business efficiency.

Harnessing Blockchain's Potential

IDC expects the global blockchain market to grow to US$11.7 billion by 2022 from a base of US$754 million in 2018, according to IDC's *Worldwide Semiannual Blockchain Spending Guide, 2H17* (see Figure 1). Following a year of experimentation, 2018 will be crucial in maturing the blockchain market, as many proofs of concept are expected to move to full blockchain deployments.

As highlighted in Figure 1, the banking industry is already a significant adopter of blockchain technology, due largely to the early interest in blockchain for cryptocurrency. As blockchain use cases continue to increase over time, many of these will not only be applicable for the banking sector (for responding to compliance and auditing), but also for other markets. IDC believes that the discrete manufacturing, process manufacturing and retail industries will be the ones driving the growth of the market spending up until 2022 due to many similar use cases spanning these three industries, as well as the banking industry.

FIGURE 1: *Projected Blockchain Market Growth*



Source: IDC's Worldwide Semiannual Blockchain Spending Guide, 2H17

Secure, aggregated and immutable records enable organizations to build direct connections between line of business (LOB) management, customers and suppliers. These direct connections can simplify business processes and improve data security and reconciliation.

Cross-border payments and settlements will be one of the top four use cases for blockchain by 2022. IDC believes that this use case will have the most traction in the coming years as it appears across several industries, including banking, discrete and process manufacturing, retail and wholesale. Similarly, identity management has uses across a high number of verticals, including financial services, government and retail. As new use cases emerge over time, those that are applicable to multiple industries will see the highest adoption rates.

Top 4 Use Cases for Blockchain, 2022

- Cross-border payments and settlements
- Identity management
- Trade finance and post trade/ transaction settlements
- Asset/goods management

Source: IDC's Worldwide Semiannual Blockchain Spending Guide, 2H17

Use Cases: A Sign of Growing Blockchain Maturity

IDC predicts that growth in blockchain usage will accelerate when organizations start to appreciate the long-term value of these early investments. New engagements will commence when a more mature base emerges as barriers to adoption fall and there is better standardization of and integration between platforms.

As highlighted earlier, blockchain adoption continues to be led by the **financial services** industry, driven largely by banks. Spurred to reimagine their digital future, many large and publicly listed banks have announced pilot projects or the intent to launch production uses of blockchain-based offerings.

While most of the use cases are around driving greater efficiencies within existing processes, other applications include cross-border payments, interbank settlement, governance-based projects around know your customer and anti-money laundering compliance.

The financial services industry was also recently the first to announce a "live" project around letters of credit for international trade, where the banks, HSBC and ING, announced they had executed a live trade finance transaction for international food and agriculture conglomerate, Cargill. The blockchain transaction involved a bulk shipment of soybeans from Argentina, through Geneva's trading arm of Cargill, to Malaysia, through Cargill's Singapore subsidiary as the purchaser. A letter of credit was issued by HSBC to ING. The two banks were acting on behalf of the Cargill entities. The digitized solution cut a huge amount of time from the traditional paper-based process. Usually taking 5 to 10 days to exchange such paper documents, the blockchain platform was able to execute this requirement in 24 hours.

Blockchain's impact in financial services is only the tip of the iceberg. Table 1 shows the range of use cases by vertical for blockchain.

TABLE 1: *Blockchain Potential Use Cases*

Industry	Potential Use Case Description
Financial Services	Cross-border payments and settlements, regulatory (know your customer, data exchange) and trade finance automation
Manufacturing	Asset and goods management, cross-border payments and settlements, warranty claims, equipment/parts management and authentication, lot lineage/provenance, supply chain monitoring and patents registration
Retail	Supply chain management, equipment/parts management and authentication, disintermediation of online payments, and cross-border payments and settlements
Government	Public data disclosure, central government registries (particularly land registries) and digital identity management
Professional Services	Legal services workflow automation, commercial property selection and real-estate due diligence
Transportation	Asset/goods management, equipment and service/parts management, and loyalty program
Wholesale	Lot lineage/provenance, asset/goods management, and cross-border payments and settlements
Utilities	Wholesale energy trading, decentralized grid management and peer-to-peer energy trading
Telecommunications	Identity as a service, 5G enablement and Internet of Things (IoT) connectivity
Healthcare	Interoperability of electronic health records, research data and personalized medicine

Source: IDC's Worldwide Semiannual Blockchain Spending Guide Taxonomy, 1H17

Building upon the work undertaken by the financial services industry, some of the use cases in **manufacturing** are financial related. Emerging at the core of the industry are use cases around terms of service and warranty management, spare parts provenance and patent registration.

At a higher level, the entire supply chain from source to customer is undergoing blockchain-enabled transformation. Many consortia are emerging, with members from diverse industries such as agriculture, logistics, wholesale and retail partnering to create an entire view of product provenance for the customer.

Governments are also looking to leverage this technology to enhance citizen services in use cases such as e-identity and e-voting. In many countries, the opportunity to rationalize and provide clarity over land and property registration, while maintaining its history, is a compelling use case along with a range of trade and finance use cases seen in other verticals. Blockchain also has a place in the Smart City initiatives of many governments.

Critically, in the **commercial** space, this technology works best across a multiorganizational environment where verification of shared data is required. The complexity here is that many industry-based consortia often need to bring together competing businesses to create the value derived from blockchain at a level of complexity that can be a significant barrier to many organizations.

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Disintermediation and Blockchain

In many use cases, blockchain disintermediates a third-party intermediary. In this area, cost and time savings are some of the consortia's key drivers, although IDC does foresee that this will result in upheaval in several industries that focus on being third-party intermediaries.

Public and Private Blockchain Platforms

Public blockchains provide universal accessibility, and anyone can initiate and take part on a public blockchain. Contracts are immutable and public — there is no way to reverse errors and everyone who is part of the chain has a copy.

Private blockchains are generally designed for enterprise access only, in that only authorized users may access the system. They offer automation of multiparty interactions and data exchange. Often, they are easier to develop and support existing enterprise toolchains/platforms as well as privacy and audit functions. One advantage of private blockchain platforms is that the cost of compute execution is not tied to a given blockchain platform's cryptocurrency.

Blockchains, however, do not scale by their very nature. The robustness that blockchain offers degrades performance, making it difficult to scale as the network grows and more users and transactions are processed, directly countering the network security that keeps the blockchain ledger immutable and secure. Expanding into other applications within banking, many enterprise systems handle business transactions at a very high rate, especially with the introduction of mobile payments and an increased demand by consumers to transact when and where they choose. With a need for higher throughput and subsecond transaction latency, vendors are working to evaluate the scalability and performance of these networks and are leveraging lessons learned from open source, public blockchains such as Hyperledger Fabric. This involves exploring the use of faster consensus protocols or mechanisms.

Financial institutions are seeing the competitive benefit in striking first. Blockchain, driven by consumers, has given banks a front row seat to new market innovations, leaving enterprises in other industries to catch up. Eventually, current projects can open new channels and present significant opportunities for global payments and settlements.

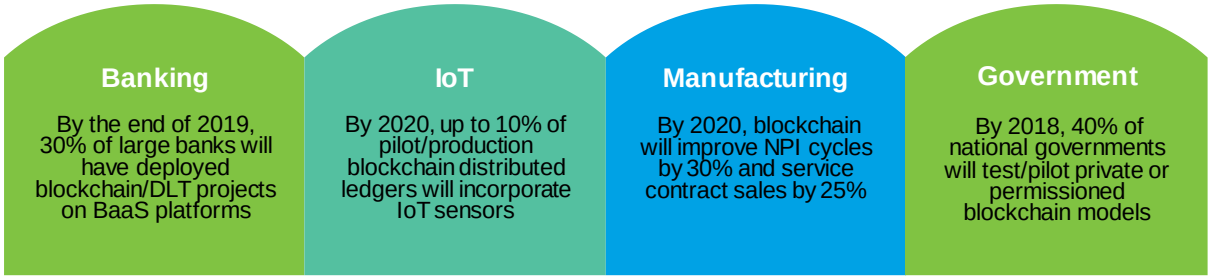
For now, the interest mostly lies with private blockchains. However, over time, public platforms will address their shortcomings and are likely to be the preferred deployment choice.

Ultimately, many of the early benefits of using blockchain are around cost savings and process efficiencies. Blockchain is a technology that can deliver first-mover advantage since, over time, IDC anticipates that the benefits to all organizations within a vertical will become obvious. When the number of participants in the consortia reaches market saturation point, those left behind will have limited choices but to follow the crowd and catch up.

What's in the Future for Blockchain?

Figure 2 highlights IDC's predictions for blockchain in the areas of banking, IoT, manufacturing and government.

FIGURE 2: *IDC's Predictions for Blockchain*



Source: IDC, 2018

By the end of 2019, 30% of large banks will have deployed blockchain/DLT projects on blockchain-as-a-service (BaaS) platforms.

Banks, financial intermediaries and technology service providers will be looking at ways in which DLT can help develop new products and services, improve compliance programs, reduce operating costs and improve liquidity.

Many financial firms are looking for ways to get started with DLT, and similar to cloud computing, BaaS options are an attractive way for firms to build, develop, deploy and maintain distributed ledgers. Leading technology firms are developing their own BaaS offerings that can be attractive to organizations having to build out their own blockchain systems.

BaaS solutions can help firms improve data collection and consolidation. Aggregation of customer information and transaction data can help improve the effectiveness of transaction monitoring for compliance programs such as anti-money laundering and know your customer.

Distributed ledgers can help firms and their financial intermediaries to aggregate information and reduce record reconciliations as well as shorten the post-trade and post-transaction settlement process. Shortening the settlement process can help reduce transaction risks and costs as well as improve liquidity of the firms involved in the transaction. IDC believes firms will focus on financial products with lengthy post-settlement processes.

By 2020, up to 10% of pilot and production blockchain distributed ledgers will incorporate Internet of Things sensors.

The proliferation of IoT sensors in key industries such as manufacturing, digital supply chains, transportation and healthcare will create a host of opportunities and challenges for IT organizations and their LOB partners. Typical IoT concerns for IT organizations have tended to be around data security. In fact, in every IoT study conducted by IDC, security of data exposed by more vulnerabilities has been the leading challenge of IoT deployments in production environments.

One of the goals of an IoT ecosystem is to provide secure data to the right person, at the right time, in the right place, and in the right format. By creating information about company assets beyond traditional sources such as radio frequency identification (RFID) and barcodes, blockchain provides a unique opportunity for IoT and blockchain to work together.

With this combination in play, organizations can quickly identify when goods and services have been delivered according to contractual agreements, and thus only need to maintain "one electronic version" of the truth.

For this reason, IoT and blockchain will bring an increased level of authenticity into payment systems. Created to enhance the security and efficiency of data recording and processing, DLT and smart contracts can help with:

- **Transparency.** All participants of the DLT will have access to the logic of the smart contract; this provides transparency to what is being agreed in the digital contract. Transactions are also recorded to provide a clear audit trail.
- **Integrity.** Records are reconciled against each other to ensure that no unauthorized changes have been made.
- **Durability.** As records are not controlled by a single system, there is no single point of failure in the entire DLT network. This makes a DLT network more durable and robust.
- **Resource reduction.** Resources and time taken for transactions can be reduced with DLT and smart contracts acting as middlemen or agents. This is especially so in the case of smart contracts in which predefined conditions are agreed upon, and a self-executing process takes place once these conditions are met.
- **Eliminating errors.** Errors in calculations can be omitted as all nodes on the network process the transactions individually, updating and reconciling the records.

In the area of machine to machine (M2M) communications that will underpin IoT of the future, blockchain is something that IDC believes has the potential to drive adoption by being able to secure data and communications and potentially deliver on M2M transactions in the future.

By 2020, global manufacturers deploying blockchains for product design and service delivery will have improved new product introduction (NPI) cycles by up to 30% and will have increased service contract sales by up to 25%.

IDC expects pilot projects to continue proliferating in the coming months as manufacturers become more familiar with blockchain technology and find new uses for it. On the front end of the product life cycle, NPI cycles could improve through the use of a distributed ledger to assist with product design collaboration, which would yield shorter product development cycles due to faster design and design team validation.

On the service end, creating the immutable history of an asset, and its parts and maintenance records, provides a level of visibility throughout the service life cycle that enables the creation of new, value-added service offerings that can be monetized.

By 2018, 40% of national governments will plan to test and/or pilot private or permissioned blockchain models to aggregate and track protected data, enabling trusted data sharing between organizations.

In the public sector, governments have long faced a challenge of how to establish clear rules regarding who has control over specific types of information, how to confirm data accuracy and how to set rules about who retains long-term authority over a piece of data, especially when it comes to updating or modifying that information. Blockchain could be the answer to this problem.

Blockchain solutions hold great potential as an ongoing framework capable of addressing these challenges. If resourcefully applied, it is possible that blockchain technologies could be a key tool for confirming data origin and accuracy, tracking update and establishing true data authority for millions of different data fields.

Considering Samsung SDS Nexledger

Samsung SDS is addressing these market opportunities through Nexledger, a horizontal platform which the company has quickly productized for a variety of verticals including government, manufacturing and logistics, and already has a commercialized case in the financial industry.

With use cases across a large number of verticals, Samsung SDS is among the first global vendors to have commercialized use cases, and is also among the first in the world to have a successful blockchain-based customs clearance technology verification. In addition, Nexledger has more than 30 patents related to the platform, including its own specialized consensus algorithm.

An open-source hybrid, private-permissioned blockchain platform, Nexledger consists of a blockchain core that integrates a range of components such as monitoring tools, external linkages, application programming interfaces and a structured DevOps environment. This has created a full-features platform for diverse use cases that also comes with some significant performance increase over what is seen in the public blockchain that supports Bitcoin. The new performance attained by Samsung SDS should meet most enterprise requirements in terms of transactions per second and ability for the platform to scale in terms of nodes (partners) added to the platform.

- **Customization of blockchain protocols.** The platform leverages some of the fundamental ideas behind open-source blockchain, Hyperledger and Ethereum. Samsung SDS further enhanced these areas with its own work. For example, aspects of the open source protocol such as the unspent transaction output, public/private key and core engine — which resemble what can be found in the Bitcoin blockchain — can also be found within the Nexledger blockchain platform, along with a range of new features built by the Samsung SDS team.
- **Embedded authentication.** Samsung SDS has also adopted the Hyperledger Fabric with an overall architecture that utilizes a certificate authority. From Ethereum, Samsung SDS is leveraging the concept of enterprise-level smart contracts, a programmable interface to customize and automate transactions across the chain; they have also developed their own patented consensus algorithm to underpin this. As an open-source hybrid model, Nexledger supports flexible updates from the open-source community which can be easily integrated to follow the principals of global DLT. The result is a blockchain platform that already has a number of proven services that can be immediately leveraged.
- **Built-in security.** Samsung SDS has also addressed security within this offering with a range of security services that include authentication and authority management; identity provisioning and management; and encryption/tokenization, which has been embedded within. At the user interface level, consideration has been given to the types of devices that may be needed to access the platform and therefore, mobile, smart devices and browsers are supported.
- **Efficient processing.** Beyond this, several customized changes have been made to the platform to meet Samsung SDS customers' commercial needs while ensuring the platform is a commercially friendly offering. Described as a qualified blockchain technology platform, Nexledger utilizes a qualified consensus algorithm. The critical algorithm can reach consensus even if nodes are missing from the network, making itself a fault-tolerant platform. Further, the platform is permission-based and has addressed the performance and security concerns found within the public blockchain that underpins Bitcoin; Nexledger, according to Samsung SDS, is over 100 times faster than the blockchain platform underpinning Bitcoin. Management and monitoring tools have been introduced to help handle large data transactions as well as an increase in the number of transactions, which are targeted to address the issues and concerns surrounding the known limitations of the public blockchain that powers Bitcoin.

Overall, Nexledger incorporates a range of tools and performance criteria that make the system far more suitable for business use than the public blockchain.

The platform enables a wide spectrum of services with a single point of support for multiple digital services. It is offered with a flexible development platform that allows customers, with the help of Samsung SDS if needed, to deliver customizable applications that address the needs of organizations or a consortium.

Current offerings from Samsung SDS are:

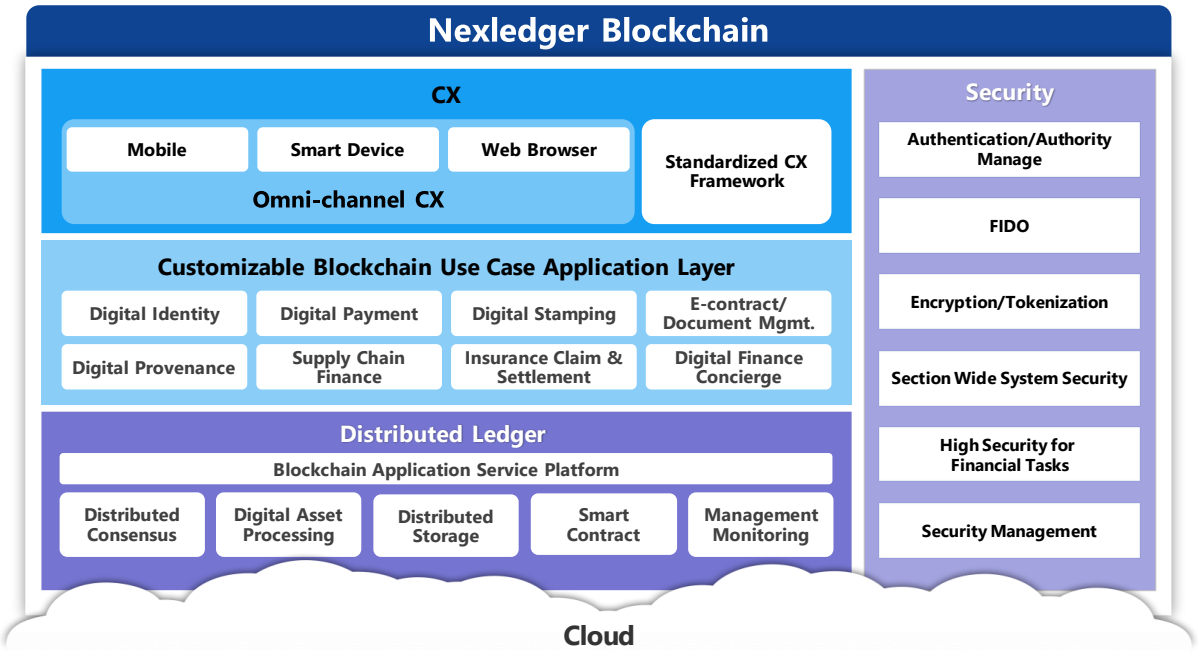
- Digital Identity
- Digital Payment
- Digital Stamping
- E-contract/Document Management
- Digital Provenance
- Supply Chain Finance
- Digital Integrity
- Decentralized Escrow
- Insurance Claim & Settlement
- Digital Finance Concierge

Samsung SDS also has a services arm that can provide consultation to organizations on the applicability of blockchain to organizations for custom projects beyond the productized offerings listed above.

A critical aspect of the offering is the flexibility it provides to potential customers. Customers could opt for an on-premises version of the platform, which would likely be the preferred model for governmental usage. They could also opt for one that integrates container technology, which can be implemented as a cloud-based solution across, but not limited to, Amazon EC2 or Microsoft Azure. Samsung SDS also recently launched a digital finance platform to provide a variety of services being operated on the Nexledger platform. The services include Digital Finance Concierge and AI Virtual Assistant, which are powered by Samsung SDS's capabilities on artificial intelligence.

Figure 3 illustrates how the different solutions fit in the Nexledger architecture.

FIGURE 3: *Blockchain Architecture by Samsung SDS Nexledger*



Source: Samsung SDS, 2018

Customer Use Cases

Nexledger has proven itself in several use cases in digital authentication, logistics and product provenance. These successful implementations have highlighted blockchain's value in enabling trustworthy, transparent transactions among multiple parties. At the same time, many of the cases have seen real-world cost savings due to the ability to no longer use expensive third-party intermediaries.

Financial Services

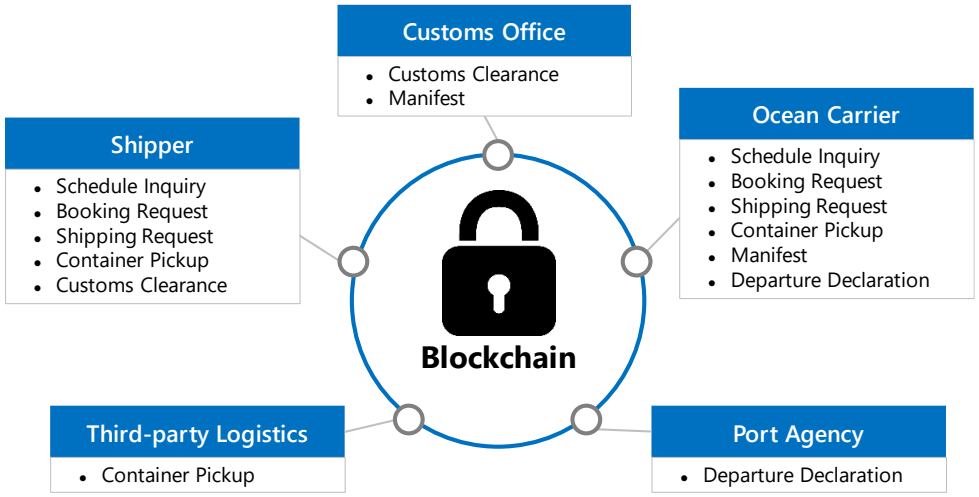
- **Case 1: Simple third-party logins for credit card customers.** This project involves using customers' identity information with Samsung Card to authenticate users for third-party logins. For example, logging into Burger King (which many people do not have an ID for) may be a hassle because the user would have to go through the identity creation process. With Samsung Card's blockchain authentication, users can authenticate themselves through a simple verification method, thereby making a seamless and secured experience for them. Furthermore, Samsung Card would be able to keep track of how a certain customer used Samsung Card credentials to login using blockchain ledger. By so doing, the blockchain solution helps lower costs and risks of operations.
- **Case 2: Integrated customer authentication system.** In this project with Korea Federation of Banks, Samsung SDS was tasked with creating a blockchain network for intra-, inter-bank and cross-financial sector business process improvements for a considerable 18 banks. In Korea, there has been a high need for a new, integrated customer authentication system, due to the fact that the existing system requires customers to register with the banks for a new service they subscribe to, which is clearly not an efficient or customer-friendly system that frequently requires third-party intermediaries to authenticate data. Samsung SDS needed to create a user identity system that the banks and the regulator could leverage to improve the efficiency of the system while still maintaining compliance with what the regulator needs. During this project, Samsung SDS Nexledger had successfully undergone a stress test in which it had to process thousands of interactions per second, in a cloud environment with over 100 full nodes. This project is a testimony of Samsung SDS Nexledger's commitment to speed, completeness of transaction, quality and scalability.
- **Case 3: Trusted environment for insurance providers and patients.** In a recent project, Samsung SDS is working on constructing a joint authentication system for multiple life insurance providers based on blockchain platform. This joint authentication system will connect patients with healthcare providers and health insurance companies to innovate medical insurance claim, evaluation and reimbursement processes. Once the system is fully utilized, patients can use an online app to automatically transfer data from their healthcare provider to their insurance company and automate the medical insurance claim. Moreover, the health insurance companies will no longer struggle from reimbursing the wrong amount due to manual data entry errors.

Logistics

- **Case 4: Innovative e-contract management system.** Samsung SDS has also worked with the Maritime Logistics Consortium on the topics of e-contract/document management. Addressing such content as bills of lading and letters of credit, the project resulted in a reduction in the time taken, from 15 days to 3 days, to clear cargo between 11 locations across the markets of Korea, China, Japan, Vietnam, Thailand, India, United Arab Emirates (Dubai), the Netherlands and the USA.
- **Case 5: Efficient product provenance tracking.** Samjin Amook, a Korean fishcake manufacturer, deployed Samsung SDS's blockchain platform to track the provenance of its product from the point of origin, Vietnam, to the local point of sale in Korea. Tracking spanned the entire supply chain, from production quality of the fish at the point of origin, including aspects such as feed production and breeding status, to distribution, customs and retail. Consumers could check the provenance of Samjin Amook's products throughout the process simply by scanning a QR code. Blockchain was used to track the product's material status, location and handling through the many stages, thereby ensuring the product's quality. The success of this project led Samsung SDS to run additional proofs of concept with ASK (All About Seafood Korea), which represents eight seafood processing companies in Korea.

Figure 4 outlines how blockchain affects different stakeholders within the logistics industry.

FIGURE 4: *How Samsung SDS Nexledger Impacts Different Stakeholders in the Logistics Industry*



Source: Samsung SDS, 2018

Manufacturing

- **Case 6: Effective e-contract management system and document verification.** The challenge for Samsung SDI, the renewable energy arm of the Samsung group, was around authenticating raw materials entering the supply chain for manufacturing a range of batteries and other renewable energy forms. The supply chain crossed numerous geographies with a large number of subcontractors and varying degrees of security. Samsung SDS deployed the blockchain platform to eliminate the possibility of fraudulent risk and forgery. It leverages several modules: e-contract with document management and digital stamping for document verification. The result mitigated the issue of fraudulent activities or forgeries entering Samsung SDI's supply chain. Furthermore, subcontractors, who have to be validated to join the blockchain, benefit from faster payments as the documents they submit are quickly verified, improving the velocity of the process.

Government

- **Case 7: Futuristic blockchain consulting project for the government.** Samsung SDS has also worked with the Seoul Metropolitan Government to:
  - Develop a strategy for implementation of blockchain technology on administrative processes.
  - Improve transparency of operations among agencies and offices to increase convenience of services for citizens (e.g., improving overall transparency of the used car market).
  - Map out future plans and design of blockchain application for welfare, public safety and transportation services by 2022 (e.g., enhancing efficiency of providing special allowances to the public).

Furthermore, Samsung SDS is working on expanding its use cases by integrating blockchain and IoT in the logistics industry, and some use cases in the public sector area.

Challenges and Opportunities

Successful Samsung SDS Nexledger use cases have proven blockchain's utility as a means of providing an immutable record that enables transparent transactions. The emerging technology, however, is still off the radar for many organizations.

Samsung SDS's experience in providing consulting on blockchain, implementing blockchain platforms and operating the entire blockchain system will prove invaluable once more organizations realize the technology's potential. Right now, the market lacks the knowledge needed to understand and implement blockchain technology. In particular, IDC research shows that the distributed ledger market is still very nascent. Only a small segment of the market, generally at the top end, is actively embarking on any form of blockchain initiative.

The blockchain market today is a greenfield for first movers like Samsung SDS. When the technology starts gaining traction, the platform provider is well positioned to take hold of this opportunity as it has gained critical experience implementing several successful use cases with customizable modules that can be put to work immediately.

Additionally, Samsung SDS is expanding its partner ecosystem to articulate the business value and recruit technical expertise for a range of desired technical outcomes. For example, Samsung SDS is already collaborating with Ernst & Young, a global accounting and consulting firm, to discover new business opportunities in the blockchain market and to share about market trends and global technologies. Furthermore, Samsung SDS has chosen AWS as its cloud service partner to provide blockchain as a service.

Conclusion

Although it is still early days, the potential for blockchain technology to deliver significant savings in terms of increased velocity of transactions, reduction of paperwork, and the corresponding increase in the integrity and security of documentation is significant. Different industries will find differing areas to apply this technology, but all will find that the value of the technology will increase as more "members" of a consortium are added. Much of what blockchain can deliver will underpin digital transformation strategies.

Samsung SDS has the advantage of being part of a conglomerate and therefore has been able to test and productize a number of offerings within a variety of industries. This puts them in a strong position as a potential global player to take on the emerging blockchain market.

IDC believes this market is set to experience some significant growth over the coming years and, as has been stated here, much of the opportunity will be captured by being a first mover in the space. Once savings and efficiency have been established, it will be clear to the rest of the industry that this is the route to take. While ongoing savings and efficiency will be a part of the new reality, early adopters will see these benefits first.

Message from Samsung SDS:

Founded in 1985, Samsung SDS began as the ICT arm of the Samsung Group, and is now a global IT solutions and services provider with presence in 30+ countries. Its business areas span IT and cloud services as well as enterprise solutions. Using advanced analytics platforms, AI, and blockchain technologies, its solutions serve a diverse range of industries, including financial services, smart manufacturing, global logistics, and retail. The vision of Samsung SDS is driven by a desire to get to the core of problems, leveraging the most advanced ICT technologies and solutions to discover actionable insights.

For more details on Samsung SDS, please visit www.samsungsds.com. To learn more about our solutions, visit our YouTube channel: www.youtube.com/samsungsds. Also, join us on LinkedIn: www.linkedin.com/company/samsung-sds and follow us on Facebook: www.facebook.com/samsungsdsglobal.

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