Case Study: India's Income Tax Department Uses Blockchain To Simplify Tax Processes

by Ashutosh Sharma
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Why Read This Report

Tax compliance is key to an economy, but most countries struggle with complex tax environments due to a multitude of stakeholders and labyrinthine policy evolution. To promote compliance, tax authorities must make their services easy to use, equitable, transparent, and consistently enforced. India's Income Tax Department (ITD) decided to use a blockchain-based solution to improve its tax processes. Its experience envisioning and building solutions for all stakeholders provides valuable lessons to CIOs who are considering using distributed ledger technology (DLT).

Key Takeaways

Blockchain Requires A Big Vision But A Pragmatic Start
Running blockchain in an ecosystem unleashes some of its key powers. Blockchain requires that multiple stakeholders join the platform to address mutually useful use cases. However, it is more pragmatic to address simple use cases first and build on that experience before scaling up and out.

Blockchain's Costs Aren't Inherent To The Technology Itself
Permissioned blockchains are less expensive to build than public blockchains such as those running cryptocurrencies like Bitcoin. However, they require significant effort in the initial legwork to convince partners to come on board and drive adoption.

The Right Partners Drive Adoption
Not all participants will see value in running a blockchain node on their own. The right technology partners can help entities with limited appetite for blockchain to defray upfront costs through a shared or hosted blockchain platform.

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The Indian Government Is On A Digitization Spree

Indian citizens' digital maturity is rising in parallel with their expectations for interacting digitally with government entities.[1] The Government of India has made digital transformation a key priority, and its agencies are focusing on making physical, offline, paper-based, and manual processes digital, online, paperless, and automated. However, a fixed mindset and lack of a citizen-centric culture mean that government agencies often fall behind. India's Income Tax Department (ITD) lives by an elaborate citizen charter. Its approach to solving citizen problems using emerging technologies such as blockchain and its future vision are refreshing and provide valuable insights for digital leaders.

Situation: ITD Needed To Keep Pace With Rising Citizen Expectations

In 2019, India had 65 million taxpayers, a number that is poised to grow rapidly.[2] ITD has focused on digitizing its operational processes to support this scale. However, its predominantly citizen-centric service focus and the rise of digital citizens mean that its highest priority is to keep pace with rapidly evolving citizen expectations. As a prominent government agency, it also needs to address the key focuses of the Government of India: reducing corruption, driving transparency, and making it easier to do business. To support such varied demands, ITD needed to:

› **Build and support new digital experiences.** Only a few years ago, Indian citizens still had to queue for hours at ITD offices to file paper-based returns. Today, they expect their online tax filing experience to match their other digital experiences. ITD's citizen charter also states that it believes in encouraging voluntary compliance and helping taxpayers toward this goal.[3] In other words, instead of chasing citizens to pay their taxes, ITD wants to make the process of filing so easy and comfortable using digital technology that citizens feel encouraged to file taxes willingly and on time. For example, while taxpayers currently calculate the tax they owe at the end of the year and file a return then, ITD envisions a future where it automatically prepares a tax statement for each taxpayer prefilled with available income data. Taxpayers would simply review the statement and modify it only if necessary before filing it.

› **Work across the tax ecosystem.** ITD interacts with millions of employers, thousands of banks and other financial institutions, and many government agencies such as the Unique Identification Authority of India (UIDAI), the Registrar of Companies, and the Reserve Bank of India (RBI). As a result, it needs to build solutions that go beyond its four walls to support this ecosystem. Tax agencies must often verify the income declarations they receive from individuals and employers against data from the banks to battle tax evasion; similarly, banks must validate requests for tax withholding exemptions they receive from individuals. All of these entities need to work with UIDAI to verify taxpayers' identities.

› **Automate entire tax process chains.** Each year, ITD's systems handle more than a billion transactions. As the number of taxpayers rises, ITD needs to build systems that can operate at scale and eliminate manual interventions that slow processes down and cause poor citizen experiences.

Government projects often introduce automation piecemeal — but this is counterproductive, as it simply creates process bottlenecks at steps they have yet to automate. In a given year, individuals and enterprises participate in many tax processes, such as submitting declarations to avoid tax withholding and depositing advance taxes. ITD needs to automate processes both within its tax systems and with all external entities that participate in them. Automation initiatives must scope processes end to end without leaving even a small step unautomated.

› **Build stakeholders' trust in the system.** ITD deals with sensitive information about individuals and their relationships with financial institutions, which share data with ITD on a regular basis. ITD needs systems that respect the individual's privacy and meet the security and confidentiality needs of institutional stakeholders.[4] For example, banks share information with ITD about the amount of interest their account holders earn; no bank wants other banks to have access to information about its customers' investments.

Approach: A Blockchain Solution With A Long-Term Vision

ITD's commissioner of income tax and technology Sunil Chander Sharma has worked on a number of large-scale IT projects focusing on income tax. Sharma told Forrester that one of the key lessons he learned working in the public sector was that ITD needs to address the broader ecosystem, not just its internal processes, and not overcentralize its role. ITD and its technology partner Infosys decided that creating trust-based institutional collaboration where multiple entities need to share data securely and concurrently without a lot of point-to-point connections called for a permissioned blockchain-based solution. A DLT-based solution checked all of the boxes because it:[5]

› **Creates a single version of the truth.** The tax ecosystem includes many banks, financial institutions, government agencies, enterprises, and individuals. Sharing taxpayer data concurrently in a traditional point-to-point integration paradigm is complex and error-prone; it creates many versions of data, leading to inconsistencies and giving bad actors an opportunity to misuse it. For example, it's difficult for some stakeholders to withhold taxes correctly if income data is fragmented and taxpayers don't disclose it. A blockchain-based solution can provide a single version of the truth that all stakeholders can access in a collaborative manner.

› **Meets security and privacy requirements.** Entities can use an unmodifiable blockchain-based ledger to make data available in a secure and trusted manner. Making it a permission-controlled ledger enabled ITD to ensure that no entity other than permissioned ones can access data meant for them. It also abolishes the need to reconcile data sources, which is a big problem with traditional integration approaches. It could also eliminate fraud whereby taxpayers tamper with ITD-issued documents before submitting them to banks or other entities. These entities get a mechanism to ensure that such documents are valid and have not been tampered with.

› **Builds a reliable, future-ready system.** Income tax regulations usually change annually, and new requirements sometimes come even in the middle of a financial year. ITD could programmatically control a smart contract-based system running on blockchain to account for new regulations and enforce new policies across stakeholders. This minimizes or eliminates the need for stakeholders like banks to spend money on IT every time regulations change. For example, banks are required to tax the interest taxpayers earn above a given threshold; a smart contract-based solution could ensure that all banks are simultaneously notified when a taxpayer's interest earnings cross the threshold. If future regulations mandate a different threshold, then ITD can enforce it uniformly across all stakeholders.

ITD Addressed The Entire Ecosystem

Once it zeroed in on blockchain for characteristics like immutability, a consensus-driven approach, permission control, and the ability to write smart contracts, ITD decided to collaborate with Infosys to pilot some use cases (see Figure 1). ITD and Infosys established key success principles for the blockchain initiative, ensuring that participation was painless as possible, that all parties stood to gain from participation, and that the selected use cases would:

› **Follow the path of least resistance.** ITD and Infosys selected use cases where multiple external stakeholders exchange data in real time. To avoid depending on regulatory change, they carefully selected use cases that could piggyback on existing reporting requirements for entities that deduct or collect taxes and deposit them with ITD on behalf of people. Stakeholders in these processes were aware of their failure points and willing to participate if it required minimal effort. For example, Form 15G and Form 15H automation was a good candidate, as most banks already report interest income to ITD. To do this in the blockchain world, they just needed to post this income in a ledger shared with ITD (see Figure 2).

› **Have high impact.** ITD and Infosys identified tax processes that are currently manual, span multiple parties, and require additional verification steps by those parties due to the potential for misuse. Solving such complex problems will eliminate major pain points and ensure significant positive outcomes for both taxpayers and other institutions in the ITD ecosystem. For example, putting Form 26AS on blockchain ensures that neither lenders nor ITD need spend a lot of time certifying the provenance of the document, shortening the loan process and improving the experiences of genuine borrowers (see Figure 3).

› **Expand to accommodate new use cases.** ITD went with a solution architecture that can support similar use cases in the future or build new ones resulting from regulatory changes (see Figure 4). For example, the Government of India recently imposed a tax on large cash withdrawals to dissuade people from using cash. Imposing the tax in a silo for each bank would defeat the purpose, as people will just withdraw smaller amounts of cash from multiple banks to stay under the limit. A blockchain-based Form 15G/H solution can easily extend to track cash withdrawals across banks, just as it tracks interest earnings. Likewise, this Form 15G/H architecture and platform can extend
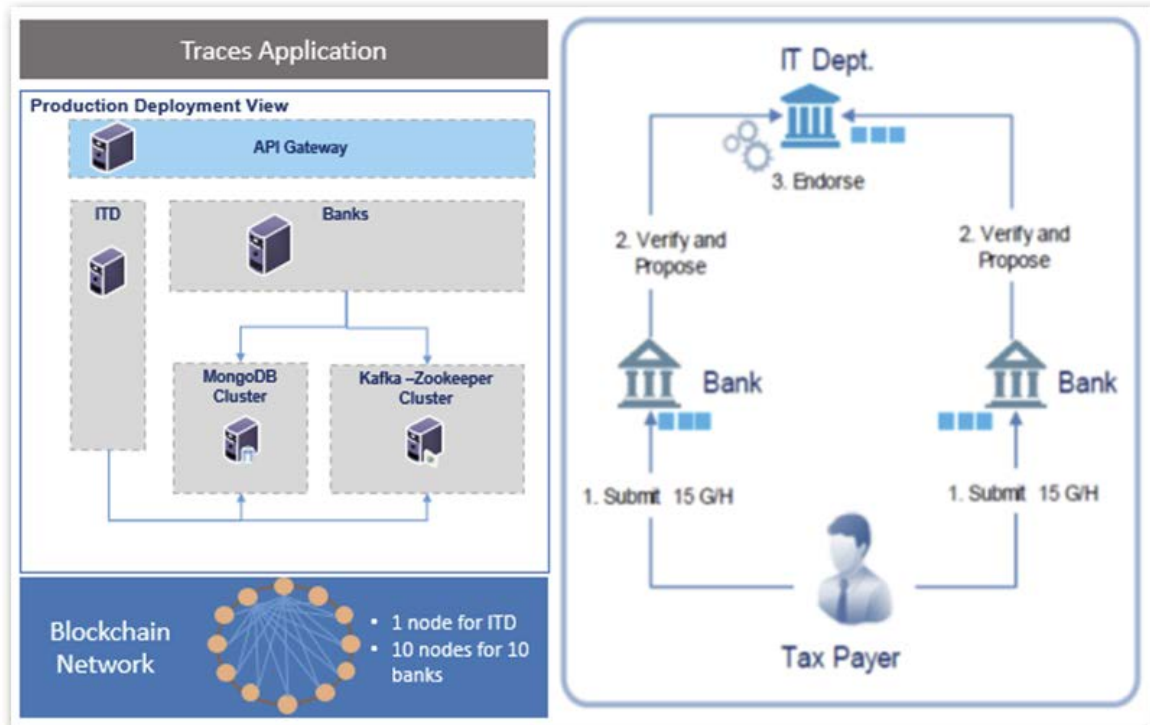
to real-time monitoring of different thresholds for transactions such as large purchases, foreign exchange remittances, and foreign exchange expenses on credit cards. ITD plans to create smart contracts to handle such reporting or taxation requirements in an automated manner.

› **Provide technology options to drive adoption.** Stakeholders' tech maturity and business strategy differs. Some want to build their own solution; others want a prebuilt, ready-to-use node. Some of them are happy with the use cases ITD has identified; others will likely want to build more use cases in that platform. Instead of just being a tax compliance monitor, ITD took on the role of ecosystem partner for this initiative. It sponsored a blockchain sandbox so some banks could pilot the solution on their own and be more confident adopting it. Infosys pitched in with an offer to host nodes on its own blockchain platform. This also gives banks the choice to either use an ITD-supplied shared node, build one on their own, or use a node hosted by Infosys exclusively for them.

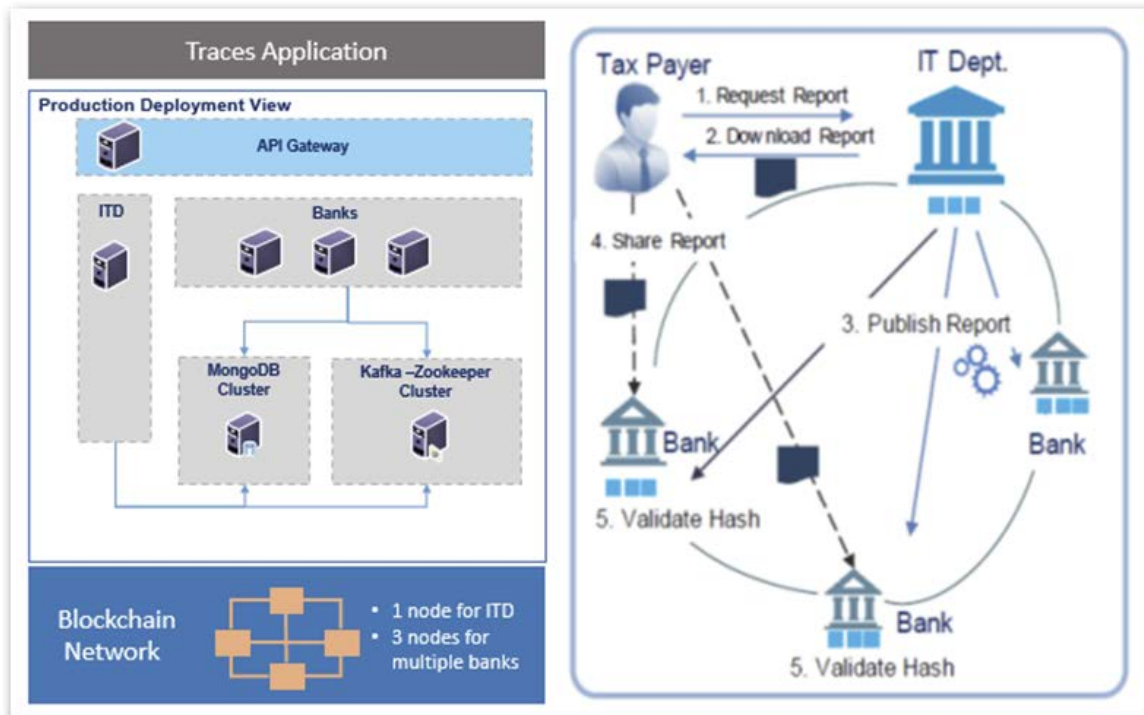**FIGURE 1** Use Cases Enabled On Blockchain

Income tax process	Key problem	Blockchain approach
Form 15G and Form 15H: Banks do not deduct withholding tax (tax deducted at source [TDS]) on interest income across all banking relationships for an individual if this income is below the taxable threshold. Individuals file this form to their banks to affirm that no TDS must be deducted on their interest income because their total income falls below the taxable threshold.	Banks lack a view of individuals' other banking relationships — that is, they lack a consolidated view of the various Forms 15G and 15H or the interest income of an individual across multiple banks.	A common ledger where interest incomes across all banks are collected gives ITD a complete view. ITD can then flag an individual's interest income to be taxed once it crosses the threshold. This can help banks verify in real time whether an individual's Form 15G or 15H is within the permissible limits or not.
Form 26AS: A report that provides a view of all TDS, tax collected at source, and self-paid taxes. This report serves the purpose of putting all income of a taxpayer from all sources in one place; borrowers often submit it to lenders as proof of income.	Lenders looking to prevent borrowers from tampering with Form 26AS to inflate their income had no way to verify this form with ITD. Lenders could ask ITD to verify a form, which was neither feasible nor permissible under existing laws and practices.	A common reporting application that collects this data from all tax depositors can make it available and provide a cryptographically enhanced report for downstream applications. Lenders can validate its authenticity by comparing the hash value of the document submitted by borrowers with the one on the platform without revealing any personal or other information of borrowers to lenders.
Section 197 certificate: Allows TDS to be deducted or collected at a lower rate or not charged at all at the source when presented by the taxpayer.	Financial institutions have no way to validate whether the document submitted has already been consumed by another deductor. Threshold conditions cannot be arrived at due to the lack of real-time consolidation.	Having these transactions reported on individual nodes and consolidated by ITD will create a single source of the truth for all participants, enabling real-time verification, consumption, attribution, and application of upper limits.

FIGURE 2 Process Architecture And Flow For Submitting Form 15G/H

Source: Income Tax Department, Government of India and Infosys

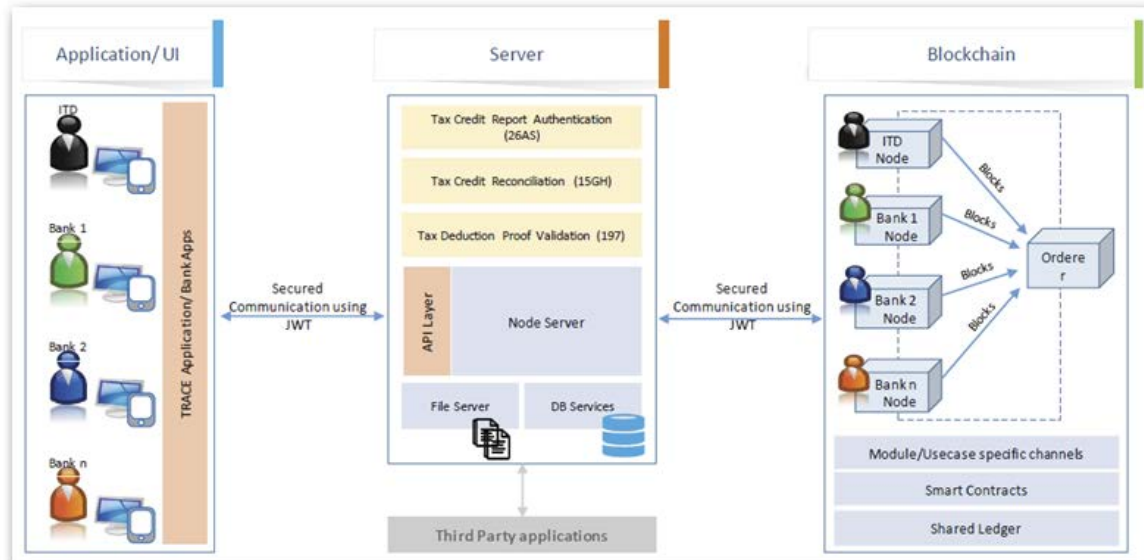**FIGURE 3** Process Architecture And Flow For Submitting Form 26AS

Source: Income Tax Department, Government of India and Infosys

FIGURE 4 Overall Architecture Diagram

Source: Income Tax Department, Government of India and Infosys

Results: Banks Are On Board; Ecosystem Partners Are Showing Interest

It's still early days for ITD's blockchain program. ITD and Infosys are already piloting two use cases, Form 15G/H and Form 26AS, on the platform and are working to launch others, including a Section 197 certificate process. This initiative will coexist with existing processes for these use cases for some time before all stakeholders come on board. That process has started, as:

› **Banking partners have started to join.** Several Indian banks expressed interest in the ITD initiative early on and are testing these use cases. The first banks to join the initiative — DCB Bank, HDFC Bank, Indian Overseas Bank, and Kotak Mahindra Bank — have finished testing these use cases with their systems. Axis Bank, IDBI Bank, and Yes Bank are about to complete the testing, and others expect to begin soon. Early-adopting banks and ITD are setting up a governance body to guide and shape this effort.

› **New partners are showing interest.** Large corporate employers, other regulators, and institutions like stock exchanges are now also coming on board. The solution architecture is such that no entity, including ITD, has exclusive control of the blockchain network. This allows other ecosystem partners to build use cases that do not involve ITD directly. For example, banks and other financial institutions are looking to share know-your-customer data at account opening so customers do not have to provide their information many times. Such non-ITD use cases on this platform are perfectly fine with ITD, as it aligns with its vision of solving problems beyond its four walls.
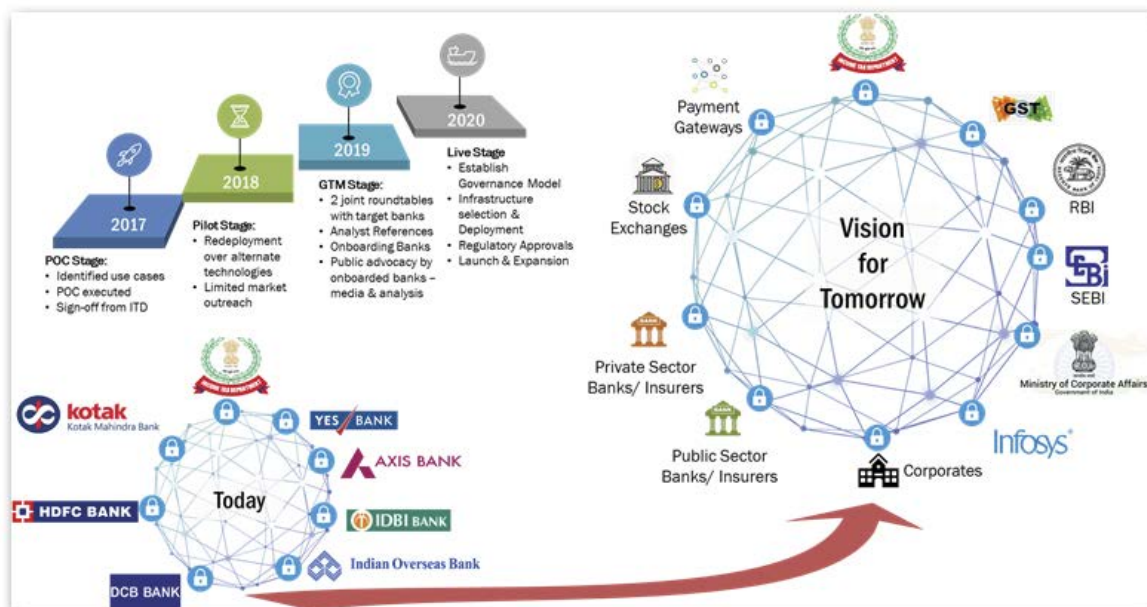
› **Regulations are starting to change to support more automation.** The initial successes have emboldened bureaucrats and banks, which are now working with the government to modify regulations so they can further automate tax processes. The Information Technology Act provides a privacy and security framework for eCommerce. The Banking Regulation Act governs the way banks interact and exchange information with external entities. When permitted by law, for example, lenders will be able to automatically download Form 26AS from ITD's systems instead of having borrowers submit them manually. Current laws prohibit them from doing so — even if they have borrowers' consent.

Next Steps: Expand The Network To Support End-To-End Use Cases

ITD is working to bring a variety of stakeholders onto the platform; this growing network currently includes seven banks. ITD and Infosys are socializing the initiative with other stakeholders, telling them how bringing their data to the network can drive more use cases. ITD is booking some early results: The stock exchange is showing interest in joining. As other parties come on board, the solution has the potential to become the trusted digital backbone of all financial transactions in India (see Figure 5).[6]

FIGURE 5 India's Income Tax Department's Vision For The Future

Source: Income Tax Department, Government of India and Infosys

Clear Justification And Partnering Hold The Key

By their very nature, distributed ledger technology projects address ecosystem problems that go beyond any one organization. The external forces that these projects are subject to can make or break your project, depending on the clarity of your vision and ability to bring multiple parties together. As a CIO, if you are convinced that your use case really needs blockchain, then you must:

› **Establish a very clear justification.** The importance of establishing clear reasons as to why blockchain is the right technology to solve your problem can't be overstated. It doesn't mean that you have to force it to fit your need, but you must first exhaust conventional options that are easier to implement. You'll have a difficult time selling the vision to your ecosystem if your use case is not convincing and pragmatic enough. Use Forrester's DLT checklist to mitigate this risk.[7]

› **Choose a collaborative senior leader to help lead your blockchain initiative.** Blockchain implementations are 80% business and 20% technology.[8] The business component of the work entails identifying appropriate use cases, bringing partners together to agree on their participation, helping to evangelize the solution in their organizations, coordinating across their technical and business process teams during implementation, and possibly working with regulators. You need a leader who is highly collaborative and able to bring multiple parties together on the journey.

› **Create clear value propositions for ecosystem partners.** Nothing will convince partners to get on board more than a clearly defined value that they will get from participating. Address the ecosystem and go beyond the value your firm needs to get, even if it means compromising some value in the short term. In ITD's case, it decided to host the nodes for participating banks for free so the smaller banks, which otherwise might not have been able to invest in building their own node, had a lower internal threshold to cross to justify their participation.

› **Choose right technology partner(s).** Implementing blockchain is difficult and complex, but the right technology providers can help. The right partner will not only bring technology expertise; it will also be willing to make an upfront investment in lieu of getting access to other ecosystem partners. This is one of its key "wins" from the engagement. In ITD's case, Infosys invested in the blockchain platform and made it available to participating banks during test and pilot phase at no cost. This helps them to sell these services to these banks in future, and the entire initiative benefits from a faster time-to-market. Seek the right tech partner in your sector and country that has the on-the-ground capabilities and commitment to support your initiative.

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Supplemental Material

Organizations Interviewed For This Report

We would like to thank the individuals from the following organizations who generously gave their time during the research for this report.

Income Tax Department, Government of India   Infosys

Endnotes

[1] See the Forrester report "The Metropolitan Indian Consumer Tech Stack."

[2] Source: "Number of income tax payers can double to 12 crore: Arun Jaitley," The Economic Times, December 7, 2018 (https://economictimes.indiatimes.com/news/economy/finance/number-of-income-tax-payers-can-double-to-12-crore-arun-jaitley/articleshow/66992934.cms?from=mdr).

[3] Source: Income Tax Department, Government of India (https://www.incometaxindia.gov.in/Documents/citizen-charter-declaration.pdf).

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⁴ The Supreme Court of India recently held that the right to privacy is an intrinsic part of the right to life and personal liberty under Article 21 of the Constitution. The Information Technology Act 2000 and its subsequent amendments, along with the Contract Act, further regulate the use of confidential and personal data by government agencies and corporations. The government is working on a general private data protection bill and is likely to enact it in the near future.

⁵ See the Forrester report "Distributed Ledger Technology: How To Get Started Without Getting Your Fingers Burnt."

⁶ Other important potential participants include the GST Council, governs the goods and services tax; the Ministry of Corporate Affairs; regulators such as RBI, which regulates banks and nonbank financial companies; the Securities and Exchange Board of India, which regulates the stock market; and the Insurance Regulatory and Development Authority of India, which regulates the insurance industry.

⁷ See the Forrester report "Distributed Ledger Technology: How To Get Started Without Getting Your Fingers Burnt."

⁸ See the Forrester report "Emerging Technology Spotlight: Distributed Ledger Technology."

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