Illinois Blockchain Initiative

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EXECUTIVE SUMMARY

The Department of Innovation & Technology (DoIT) was established in 2016 with the mission to empower the State of Illinois through high-value, customer-centric technology by delivering best-in-class innovation to client agencies fostering collaboration and empowering employees to provide better services to residents, businesses, and visitors. DoIT's Smart State vision led to the development of an emerging technology framework. The potential of Blockchain made it a critical component of Illinois' goal of becoming the first Smart State in the nation. Understanding Distributed Ledger Technology (DLT) was essential for the state IT, for business leaders and legislators to make informed and effective decisions around use and regulation of the technology.

Blockchain creates a new way for government to improve services for citizens, businesses and visitors to the state. As peer-to-peer digital economies, blockchains have the capability to address several fundamental issues. They create a secure platform that enables immutable, irrevocable digital identities. Blockchains also offer the ability to provide universal access to financial services and government benefits, as well as spur a stronger economy and create social stability through greater economic participation.

Illinois became the first state to create a consortium of state and county agencies, forming the Illinois Blockchain Initiative (IBI), to collaborate and explore innovations presented by distributed ledger technology. The group, represented by the state's Department of Commerce and Economic Opportunity (DCEO), Department of Financial and Professional Regulation (DFPR), Department of Insurance (DOI), Department of Innovation & Technology (DoIT) and Cook County's Recorder of Deeds is collaborating, along with other public and private sector organizations, to explore innovations presented by blockchain and distributed ledger technology.

The dedication and partnership created a roadmap with many accomplishments, a few of which include:

- State issued Digital Guidance expressing its interpretation that most digital currency transactions fall outside of the purview of Illinois' Transmitters of Money Act (TOMA) unless they involve a third-party intermediary.

- State launched five critical Proof-of-Concept (POC) implementations of Blockchain technology to prove the technology is "Fit for Purpose".

- In strategic partnership with numerous private entities, The Chicago Blockchain Center (CBC) was launched to be an accelerator focused on blockchain-enabled technologies and provide a platform for education, innovation and development.

- In 2018, the Illinois General Assembly Task Force report was published that highlights the use and opportunity of Blockchain technology.

CONCEPT

In 2013, Forbes reported that governments all over the world are under significant economic pressure. Thus, they are compelled to undertake austerity measures, improve efficiency, and embrace new technologies. The public sector often delays investments in emerging technology because they are the stewards of taxpayers' money. States need to perform comprehensive risk assessments to maintain high levels of transparency and accountability to the public. They also need to be compliant with legislative mandates before adopting any technology or investing in innovation.

Blockchain technologies have the potential to disrupt the competitive landscape and provide entities that adopt Blockchain with a sustained competitive advantage. A comprehensive and collaborative approach was needed to fully understand the technology and define the right adoption approach for the state. The Illinois Blockchain Initiative (IBI) was launched in 2016 with the following key objectives:

- Develop an Ecosystem for Growth and Collaboration – Define the specific and guiding role that governments can play in catalyzing Blockchain technology and supporting grassroots developer innovation.

- Modernize Governance for a Distributed Economy - Effective governance in a distributed economy will require legislative agility. Modern governance will need to carefully balance a combination of broad policy principles and technology standards.

- Identify opportunities for Integrating Services for a Highly Efficient Government - Blockchain and DLT will be used to connect disparate entities within and across regional, municipal, and state entities regarding citizens, businesses and assets.

IBI needed coordination, cooperation and innovative thinking among all partners to accomplish these objectives. As part of developing an ecosystem, the state entered into partnerships with industry leading consortiums like Hyperledger, r3, Enterprise Ethereum Alliance and the Blockchain Education Network (BEN) to advance cross-industry Blockchain technologies. These partnerships allowed the state to participate as early adopters and regulators on various projects. The state coordinated student hackathons and local meetups to encourage community participation and discussion on blockchain technology. To foster insightful legislation, the state created a task force to conduct a study of the use and opportunity of distributed technology.

To promote the right regulatory climate at the state, the Department of Financial and Professional Regulation (IDFPR) released guidance, taking a light-touch regulatory approach to digital currencies while also providing certainty for businesses operating in the space. IDFPR signed a partnership agreement with R3 CEV and Enterprise Ethereum Alliance (EEA) financial services consortiums. As a member of R3, the IDFPR will participate in the firm's RegNet and banking/ regulatory working group. As a member of EEA, the State is actively participating in the identity and pharma/ supply chain working group, defining use cases and technical standards.

Integrating an emerging technology into the state enterprise portfolio depends on gaining detailed knowledge of the technology and implementation methodologies. To advance the state's understanding of the blockchain technology, five pilots based on RFI responses have been identified and are currently in the implementation phase.

- Cook County Recorder of Deeds (CCRD) will be the first land titling office in the US to record property transfers on the blockchain. The pilot objective was to learn how the process of conveying and recording real estate transactions could be improved via changes to state and local laws, and what specific laws can be adjusted to encourage electronic-only legal instruments. The second objective was to create a holistic and accurate picture of the financial health of a vacant property in the county. CCRD in 2017 has successfully used components of blockchain technology (file hashing and Merkle trees) to secure government records on a site maintained by an authorized nongovernment reseller.

- The state has partnered with the University of Illinois to issue academic credentials/transcripts on a blockchain. Most Viable Product (MVP) focuses on credential verifications, with the goal of recording transcripts of all Illinois institutions on a distributed ledger for students/employers.

- The state partnered with Hashed Health to develop an architecture to prove the feasibility of using DLT to streamline the sharing of physician credentials for interstate reciprocal licensure. The Interstate Medical Licensure Compact (IMLC) offers a new, voluntary expedited pathway to licensure for qualified physicians who wish to practice in multiple states. The IMLC mission is to make it easier for physicians to obtain licenses to practice in multiple states. The IMLC strengthens public protection by enhancing the ability of states to share investigative and disciplinary information. The current process anticipates 60 days to turnaround a letter of qualification for a licensed physician from his/her primary license state. The letter of qualification is then manually sent to other state(s) where the physician wishes to be licensed. The POC was conceived to streamline and simplify this process.

  At a high level, the proposed architecture involves multiple nodes (one or more at each State licensing entity) and a combination of traditional database and smart contracts. State working with Hashed Health chose Tendermint as the framework for this POC. Tendermint Core, ensures that the same transactions are recorded on every machine in the same order. The application interface, called the Application Blockchain Interface (ABCI), enables the transactions to be processed in any programming language.

  The state has no direct plan to extend this POC to Pilot/production state. In the near future, private entities could develop a solution based on Blockchain that could permit states to enroll and host notes on the network. The result could be up to date credentialing data, accurate, secure and valid Credentials to all health care professionals.

- Energy producers are issued tax credits when producing "green" energy. Program would include standing up a marketplace where Renewable Energy Credits could be traded.

Credits would be granularly divisible. Potential to improve traceability and liquidity, providing better "green" energy policy outcomes.

- The self-sovereign identity model follows the older user-centric identity model and assumes that the user is central to the administration of identity. This will require interoperability of a user's identity across multiple locations with user content and user control, creating user autonomy. At the state, we believe that the ability to establish a self-sovereign identity model is key to delivering services using blockchain. In a traditional service delivery model, the state has created hundreds of data stores to support the delivery of various services/benefits. Information on citizens and business who interact with the state are duplicated many fold within a single an enterprise. This leads to complex infrastructure and resource requirements for the state to manage identities within these individual databases to provide an integrated experience for citizens and businesses. Centralized data stores do not give the user any control of their data. On the internet, this silo-based approach, where users must maintain identities for every site they interact with, has become untenable. This problem will be magnified in a public Blockchain implementation.

  Illinois has partnered with Sovrin to use The Sovrin Trust Framework to deliver a POC for initiating an identity model that could be extended to a real-world application. A person's physical identity starts with the issuance of a birth certificate and ends with the issuance of death certificate. A digital identity of a person could continue indefinitely and could potentially be used for numerous use cases beyond the physical existence of the person (legal cases, trust settlements etc.). The model under development includes the state acting as an issuer and publisher of verifiable claims/ credentials, and creation of a central claims repository managed by the identity holder. Any party wanting to validate a person's identity would request permission from the identity holder and upon approval, check against the distributed ledger to validate and verify the identity as claims.

SIGNIFICANCE

Government plays an important role in the distribution and administration of benefit and entitlement programs for citizens who meet certain eligibility requirements. Government could leverage blockchain and DLT to distribute benefits more efficiently, reducing entitlement fraud and increasing asset transparency for taxpayers. To recognize and realize benefits for such a transformative technology in a large enterprise, the state needs an effective technology roadmap. The key implication of IBI is to help the state integrate emerging technology into its' enterprise implementation design.

Developing a broad technology roadmap required input and participation from varying stakeholders across the enterprise. The Blockchain Initiative was executed as a collaborative exercise that would benefit participants by gaining clear understanding of the technology

fundamentals of blockchain, knowledge of the evolving landscape and familiarity with blockchain adoption methodologies.

The results of state's blockchain initiative can be narrowed to following:
Blockchain technology could simplify the management of trusted information, making it easier for government agencies to access and use critical public-sector data while maintaining the security of this information. Identity is key to managing and delivering data and services to citizens and businesses. Completion of the vital records POC help the State understand how a citizen-centric digital identity model based on DLT could be used to consolidate disparate data that currently exists across multiple agencies and layers of government, into a network centered around a citizen's or business' credentials, licenses and identity attributes.

IBI is helping the state understand how to digitize physical assets to increase transparency, improve liquidity and policy outcomes for incentive programs or titled assets. Creating a registry for representing shares, cars, property, or tax credits as tokens on a blockchain allows assets to be transacted and spent as currency. The irrefutable record can dramatically reduce the cost and complexity of auditing, reconciliation and issue resolution as there is a clear and traceable audit trail of transactions, data and user interactions. Not only can this can lead to a material reduction in paperwork and more efficient asset transfer processes, but it will significantly reduce transaction costs. The state is building an understanding of the impact of a DLT that could be used to supplement the Medicaid enrollment and eligibility process.

Understanding blockchain allows the state to reinvent services especially when combined with Artificial Intelligence (AI), big data, Internet of Things (IOT) and blockchain. Interesting use cases have been thought about and discussed as part of the initiative providing opportunities for technologists, law makers, policy makers and private partners to participate in effective and efficient service delivery. For example, an interesting application of a blockchain revolves around on demand service for waste management, recycling services, snow removal or use of state-owned autonomous vehicles.

IMPACT

Since the inception of the blockchain initiative, the State of Illinois has been uniquely positioned to take a leadership role in the development of blockchain technology companies due to the critical mass of industries leveraging blockchain technology located in Illinois (Financial Services, Insurance, Supply Chain and Logistics), access to talent, support of entrepreneurship, and collaboration with enterprises. The light touch regulatory approach adopted by the state has helped in creating an innovation-friendly environment creating multiple partnerships among private, public and not for profit entities.

A 2017 Commercial Real Estate Services (CBRE) report highlighted the Chicago area as a strong market for technology focused startups due to the availability of technology talent and low labor costs. Fostering development of blockchain requires providing timely education and trainings for the growing workforce. The Illinois Blockchain Initiative (IBI) has been and is positioned to continue to be an effective mechanism to facilitate educational workshops and conferences, in which experienced practitioners and experts provide knowledge, specific insight and practical application, fostering grassroots innovation through hackathons, national challenges, boot camps, and accelerators. Looking forward, the IBI will partner with educational institutions to incorporate blockchain curriculum into schools and colleges, and to support blockchain workforce development.

As a direct result of the IBI, the state provides fiscal resources through the recently renewed Angel Investment Tax Credit program. By partnering with excellent entrepreneurial hubs like 1871, MATTER and UILabs/DMDII, the state will continue to support development of talent and knowledge around blockchain. The IBI is a founding member of the Chicago Blockchain Center, created in June 2017, where services are focused on providing bespoke programming and education to the various segments of the local blockchain community.

The Illinois Blockchain and Distributed Ledger Taskforce report published earlier this year identifies a number of opportunities and recommendations for new and enhanced existing legislation to support growth and acceptance of blockchain. This is a direct result of IBI members participating in the taskforce and working closely with legislative colleagues. Currently, there are several legislative proposals being considered by the general assembly on the permitted use of distributed technology in the state of Illinois.

The IBI has helped to change in state's immediate strategy of participating in the development of blockchain based solutions across Insurance, Financial and Social Service entities rather than investing the state's capital for developing its own blockchain solutions. The state will continue to invest in use cases that would result in cost savings and efficient services using blockchain by breaking down siloes of trusted data manages by the state.

The State of Illinois will lead discussions with other state and federal entities on the potential impact that tokenizing assets will have on the revenue models in future. Illinois continues to innovate and lead the way in exploring how blockchain will provide future opportunities for public sector entities in general to pool service delivery efforts for efficiency and cost avoidance through public blockchain implementations.

For more information on the blockchain initiative in Illinois, see the following links:

https://illinoisblockchain.tech/

https://www2.illinois.gov/sites/doit/Strategy/Documents/BlockchainTaskForceFinalReport020518.pdf

https://www2.illinois.gov/sites/doit/Pages/BlockChainInitiative.aspx