

Hyperledger technology applications



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Hyperledger Technology

Introduction

Blockchains have proven to be an emerging technology in the last decade that have the potential of achieving and solving many real-world problems. Hyperledger technology is an extension of blockchain technology and has become the de facto standard that is used for the enterprise blockchain platform. It has become popular due to its ability to offer a unique approach to consensus for enabling scaled performance while preserving the privacy of a network-of-networks that are interoperable. This paper evaluates the concept of Hyperledger through defining the technology, evaluating its history, evaluating its impact on organizations, evaluating its target audience, and its impact on the users currently and in future.

Description of the technology

Hyperledger Fabric is an implementation from blockchain framework, hosted by the Linux Foundation. It is an open source enterprise-grade permission that makes use of distributed ledger technology. It is a platform that deploys blockchain networks with the platform providing smart contracts, the ledger, and providing a consensus between the members through maintenance of the Fabric protocols (Bashir, 2018, p. 16). Fabric is designed for use by businesses with the blockchain itself being operated by a set of known participants. These participants are re-identified and vetted through a concept called the permission blockchain.

The blockchain also provides a way of securing an interaction among a group of entities who know each other and have common business interests. These

entities are interested in managing a decentralized network instead of turning the management of their ledgers to one party. Through reliance on the identities and peers, the blockchain can use the traditional crash fault tolerant or the Byzantine-fault-tolerant protocols that are popularly used by distributed programs. This technology comprises several major components (Morris et al., 2018, p. 19).

A ledger contained in the fabric has a blockchain and the world state containing the status of all the assets tracked on the ledger. It also contains a history of all the changes and is replicated across various channels across all peers. The peers are the endpoints of the transactions for the organizations and make up a large part of the physical structure of the network. The channel has a subset of members in the network that want to communicate and make private transactions. Chain code is used in the implementation of smart contracts in the hyper ledger fabric (Davidson, 2017, p. 9). There is also a certificate authority which identifies all the entities that are within the network. The final major component is the Hyperledger Fabric software development kit which helps in enabling the transaction between clients and the blockchain network through the support of several languages.

History

The Linux Foundation announced the creation of the Hyperledger project in December 2015. The project was commissioned to incubate blockchain technology for use in businesses. In February 2016, the founding members were mentioned, with ten more members making up the governing board.

The objective of the project is to make advancements in cross-industry collaborations through the development of distributed ledgers and blockchain. The focus of the project is to improve the performance and reliability of such systems the same way that crypto currencies are designed to operate to ensure that the project has the capability of supporting business transactions globally through financial, technological and supply chain companies.

The project has the aim of integrating independent open standards and protocols using modules that include blockchains with their own storage routines and consensus, and having the functionality of identity, smart contracts, and access control.

The project began accepting proposals in early 2016 for incubating codebases and other relevant technologies as the core elements. The initial proposals were for a codebase that was able to combine prior work through digital assets, and the IBM blockchain. In July 2017, the project announced that it was ready to produce Hyperledger Fabric 1. 0. This led to various financial institutions such as the London stock exchange and the royal bank of Canada to adopt the use of the technology in the same year.

Current and future impact of the use of Hyperledger

Use of Hyperledger technology has enabled business contracts to be codified to allow two or more parties in automation of contractual agreements in a way that it is trusted. The B2B contracts help the parties involved protect sensitive business information from unauthorized external parties.

The technology has also impacted the supply chain industry where the final assemblers, such as those who manufacture automobiles, can create a supply chain network. This network is managed by the peers of the business and the suppliers for a final assembler to better manage its suppliers and be able to have increased responsiveness to events such as a vehicle recall.

The technology has also impacted the asset depository where it is possible to dematerialize assets such as financial securities for all the stakeholders of the asset to have access to the asset. This allows the owners to initiate trades and acquire information on the assets without needing to go through various layers of the intermediaries. The technology also enables the trade to settle in real time with all the stakeholders being able to access the information of the assets in real time.

Benefits of a business using Hyperledger technology

Hyperledger is an improved method to blockchain as it supports the capability of on-demand data retrieval. Hyperledger technology allows for data partitioning which allows the protection of data needing protection (Swan, 2018, p. 17). This is helpful for financial companies which are wanting to use blockchain technology, but are aware that their data will be made public.

Hyperledger's technology can create a level of trust with its users faster than other technologies would. This happens through the reduction of layers of trust and verifications of various transactions that are needed to be made. This helps in securing transactions without any unwanted effects.

The technology is supported by a community having different engineers and different teams contributing to different ideas on how to improve the platform for better performance. Community support also ensures that any issues that are brought up from using the technology are addressed as soon as they are brought up, as they are always available to sort out various issues.

The blockchain has been built for permission, unlike other blockchain technologies. It allows for entities to have known identities, thus making it suitable for financial companies that consider data protection important, especially if they are dealing with healthcare issues.

Target market/audience

The target market for Hyperledger technology are most all businesses which require the use of blockchain technology while at the same time needing some level of privacy and some level of control through permitting some functionalities in the network (Morris et al., 2018, p. 33).

Such a market includes companies that are in the supply chain industry, especially companies that are needed to supply sensitive materials and information. An example would be pharmaceuticals which need to use blockchain for making transactions, yet need some aspect of privacy to maintain their privacy on pharmaceutical information (Morris et al., 2018, p. 33).

Financial companies are also a target market for the use of such technology. Financial companies require financial transactions that are secure using blockchain technology, yet they need some aspect of privacy in sensitive

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financial information as well as needing some aspect of control of their assets.

The Gartner hype cycle

The Hyperledger technology falls in the peak of inflated expectations in the Gartner hype cycle. This stage involves the production of early publicity which has produced several success stories which may be accompanied by stories of failures. This stage falls after the stage of innovation trigger where the technology was formed and developed in the year 2015.

Several technology companies and finance companies have embraced the use of hyper ledger technology such as IBM, London stock exchange group, and Wells Fargo is actively adopting Hyperledger technology to carry out their activities. This combined with several supply chain companies and asset depository companies which have been successful with the use of Hyperledger.

Moore's technology adoption life cycle

This technology falls into the category of the early adopters. The early adopter category is adopted by 13.5% and contains the second fastest category of individuals who adopt an innovation. As noted by the companies that have already adopted the Hyperledger technology, companies with high opinion leadership adopt to this type of technology. Most of the companies that adapt to this type of technology are typically younger people with higher social status and more financial lucidity. Companies such as IBM have more advanced education and are socially forward more than the late adopters (Morris et al., 2018, p. 34). The companies have more discrete

options in choices than the innovators and have already realized that adoption will help them in maintaining a critical central communications position.

Future use of technology

Hyperledger technology will lead to more business to business applications in the future. A lot of adoption of the technology will be required to make this possible as many businesses, especially small and medium enterprises, tend to adopt technologies that are popular.

There may be more interchangeable modules in their Hyperledger that consist of many modules that may be interchangeable and function cohesively and secure (Asharaf & Adarsh, 2017, p. 13). The modules will be able to communicate with other modules that are either of the same or different types of modules. At some point, even an amateur will have the ability to quickly and efficiently use them in setting up a secure blockchain that is interoperable.

The technology will also experience a requirement of more and more anonymity even in the public network. Privacy is a fundamental issue in the age of information, thus the need for more institutions to require that their information becomes private. This will prompt for the demand for more public blockchain technology.

There may also be many blockchains that work together, and each blockchain will have a collection of tools. The goal of Hyperledger isn't becoming a single software stack, instead creating a collection of several tools which are built with interoperability and modularity in mind. Any

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business and individual will have the ability to use some or all the Hyperledger projects in creating a distributed ledger which meets all their needs personally or in a business setting (Velasco, 2017, p. 722).

There will also be more accountability of the blockchain in the system. Hyperledger technology has addressed this and keeps on addressing this through the use of visibility and consensus to ensure that the blockchain is available for businesses.

Ease of use of Hyperledger technology to the organization

The ease of use in adopting Hyperledger technology to the organization depends on the nature of the business of the company or organization. Companies in the financial sector may find it easy to implement the technology to their organization as it may address significant issues that the business has (Swan, 2018, p. 35). A commercial business mostly deals with transactions that involve money and commodities. Hyperledger technology also addresses transactions thus making it suitable to be implemented in finance.

Challenges of adopting Hyperledger technology

The significant challenges facing Hyperledger technology are the same challenges that face blockchain technology as a whole. Many companies that use the technology are faced by a massive task of ensuring that the privacy of the data is protected from unauthorized users. Failure to provide such protection will render the whole Hyperledger system untrustworthy, which may result in the whole system being ousted by an organization.

Hyperledger technology may require a high cost to set up. This makes it hard to implement the technology because there is uncertainty as to whether the technology will have returns for the organization (Swan, 2018, p. 78). It thus becomes a risky investment for the organization to undertake.

Conclusion

Hyperledger technology is a type of blockchain technology that has advanced to incorporate the concepts of privacy and control in the system. It is a project that has been undertaken by the Linux community. The significant users of Hyperledger technologies are business organizations. The main applications of the technology include financial markets, supply chain in pharmaceuticals, and asset placement and classification. The benefits of using hyper ledger technology include that it is secure and provides a faster method of verifying transactions. Challenges faced by the technology include high costs for initially setting up the technology.

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