National Payments Corporation of India – Blockchain-based Payment System

The National Payments Corporation of India (NPCI) has designed and adopted Vajra – a blockchain-based system for automating payment clearing and settlement processes of NPCI products such as unified payments interface (UPI) and Rupay card. Vajra platform can be accessed by various payment companies for providing secured transactions on their online platforms or mobile applications. In addition to securing payments, this blockchain-based technology will also help the Unique Identification Authority of India (UIDAI) in facilitating Aadhaar authentication.

Additionally, Vajra will be permissioned network that will be set up so that only the parties who have been approved by the Network Adminstrator can be a part of the network. Highlighting some of the key benefits, NPCI said that incorporating Distributed-Ledger-Technology (DLT) will help the payment processing industry with minimal reconciliation of transactions, high resilience, and efficiencies through automation and transparency. It will also help the industry in minimizing the operations and financial risks while making transactions economical, immutable, secure, and easily accessible by providing a legitimate audit trail.

The platform has three types of nodes:

* Clearing House node (CHN): this has the administrative rights to the platform and is directed by NPCI. It also has the right to add a new node on the platform.
* Notary node: which validates transactions only of the Aadhaar biometric, is used for authentication process, receiving transactions only form the clearing house node
* Participant node (PN): for all banks ASP/ PPI/PSP. It has the ability to post, receive, and view transactions.

The Vajra platform can be accessed by multiple payment entities for performing transactions via web interfaces. The bank nodes will receive requests from APIs and will process it on the platform. The system will have self-executing contracts containing business rules. After successful processing of the request, the on-chain data (for example, hashes of the transactions) will be added to the ledger. Each participant node in the network will maintain a ledger of their own. While the off-chain database will be used to store information that is not published on the platform (transaction data which doesn’t uniquely define the transaction), it will be accessible to the node.