

# Comparing Cross Border Remittance Solutions: A Case Study of Ripple and SWIFT Technologies

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## Abstract

Block chain technology is considered as one of the most revolutionary disruptive technology in decades. It works on the model of decentralized distributed database of immutable records. With the advent of block chain technology way back in 1991, there has been continuous research work in the area of its application in various fields. This technology is still evolving in the areas of scalability, privacy and interoperability. The present paper aims, by extensive research to identify the potential of block chain technology and its application to permeate into various domains and is specific in terms of banking sector. A review of existing cross border payment model at banks is carried out to understand the nuances of the present model being used in banking sector and propose a block chain model to enable quicker and seamless transaction between two entities. Though Ripple and SWIFT facilitate international financial transactions they use different approaches and comparing their functioning gives a better clarity towards deliberating on the application of block chain technology in hard core banking specifically in the area of Cross Border Transactions and to propose an integrated model to improve the efficiency of cross border payments. The authors propose an integrated model for faster and smooth transition.

*Key words: Blockchain technology, Distributed Ledger, SWIFT, RippleNet, Cross Border remittances*

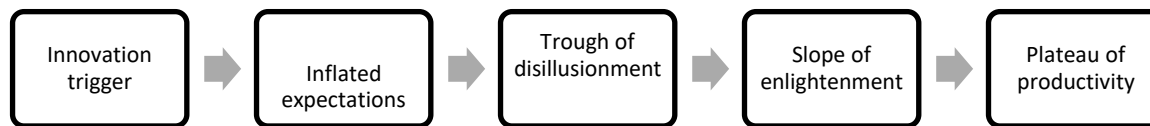
## Introduction

Block chain technology is considered as one of the most revolutionary disruptive technology in decades. It works on the model of decentralized distributed database of immutable records. With the advent of block chain technology way back in 1991, there has been continuous research work in the area of its application in various fields. Though this technology found its origin in bitcoin/ cryptocurrency, its application is no more limited to mining of cryptocurrency. The four key features of Block chain are: decentralized systems, distributed ledger, safe and secure ecosystem and Minting. These features are the fundamental of any organization dealing with people, finance, data, transaction and records. From the first application of Blockchain technology in digital ledger systems, applications today are multifarious and

is being implemented globally in almost all businesses. Privacy and enhanced security are the main features of block chain and hence has found its trail in many domains like health care, distributed storage system, decentralized voting, contracts and proof of documents.

The Financial ecosystem has gone through a paradigm shift with disruptive technology being the edifice on which processes have been reengineered and revolutionized. Banking sector is driven by technological advances, thus impacting customer need and satisfaction. Block chain technology is the path forward to empowered functioning for the end user and curtails all shortcomings of the present transaction models. Many research papers have propounded that the future of Fintech will be supported by block chain technology.

### Stages in rise and adoption of Blockchain technology



Source: Gartner’s hype cycle (Henry Stewart Publications)

Year 2015 witnessed new and latest innovations of Blockchain technology, which has now spread its wings in both financial and non- financial sectors. The business world has started adopting the technology. The areas of use of the technology is seen in financial sector in terms of data storage(PeerNova), Trading platforms ( equityBits, Coins-e, Bitshares etc.), gaming industry ( Playcoin, Deckbound), currency Exchange and Remittance ( Coinbase, Ripple, Stellar, BitPesa etc.), Peer to peer (P2P) transactions ( BitBond, Bitnplay etc.). Barclays have already reported 45 internal use cases of applications of Blockchain technology and Citibank has created its own coin, the Citicoin.

### Applications of block chain technology in financial transactions

Though in the nascent state, applications of blockchain technology has been successful in businesses in many domains. The Star Online tech news(sep8 2016)has reported one of the success wherein Barclays and Israel based start up company claims to have conducted the first trade transaction using block chain technology. This transaction was completed in less than four hours as compared to the ten days on their traditional platform.

Ravi Shankar(2018), in a white paper on cross border transactions using blockchain enabled by big data, identified regulatory and compliance factors as the two key critical factors contributing towards internal resistance in organizations to adopting blockchain. The researcher proposes a collaborative approach to regulatory reporting by leveraging big data and introducing an added data layer along the payment involving the blockchain. This could lead to ensuring transparency among the networks thus curtailing transactions with ‘high risk countries’. Transaction monitoring and validation of both the originator and beneficiary for FATF/APG/EAG can be implemented easily. Miraz and Ali (2018) raised the issues related to security and privacy in FinTech and E-commerce transactions and the trust related challenges that IoT technology is facing today. This can be curtailed by introducing block chain technology, with the help of which all devices connected on the IoT can be traced easily.Also,with the Peer-to-Peer (P2P) transaction revolution enabled by block chain, the involvement of intermediary commercial banks can be detached from the whole system thus increasing the trustworthiness, security and privacy to the users. Though the threat of losing many jobs lurks around the introduction of block chain, its successful applications in various domains like payroll and settlement, reputation management, private data storage and smart

cities has proven success, faith on the longevity of blockchain has increased says Supriya and Vrushali(2017).

### **Applications of block chain technology in Healthcare**

With healthcare turning digital, blockchain has found its application there as well. Health care is a data-intensive domain and includes health care records of the patients. Xiao You *et al* (2016) proposes an application called Healthcare Data Gateway(HDG) which is embedded on blockchain technology. Using a simple unified Indicator-Centric Schema (ICS), a patient is ensured of full control of all personal health care data and practically organize and maintain records. Siyal et al (2019) ascertain the need for safe, secure and scalable (SSS) data management in healthcare where privacy and accuracy of patient's health record is of utmost importance. This can further be leveraged for Telemedicine practitioners who can get access to authenticated patient details and thus discourage intermediary health care centers in owning patient's information. (Morgan Peck, 2017)

### **Applications of block chain technology in other areas**

Blockchain technology has permeated into non-financial applications too. Notarization can be effective and less expensive using blockchain. Privacy of the seeker and document in notarization of legal documents is taken to the next level by publishing Proof of Publication (PoP) using cryptographic hashes. Proof of Ownership(PoO), Proof of Existence(PoE) and Proof of Integrity(PoI) form the certifying documents which represents the verification authenticity (Crossby et al,2015).Manual efforts for gathering and collating feedback directly from the school was removed by implementing private blockchain system by Akshay Patra Foundation. Kiran (2017) confirms that by bringing in transparency to the meal chain, audit and invoicing processes are more efficient and Blockchain has eliminated any manipulations by the intermediaries in the feedback process.

Ivan et al (2019) propose that the dynamic transition in industrial production which is well described by the term Industry 4.0 can incorporate 5G network and blockchain technology into the ecosystem in order to achieve capabilities leading to the success of Industry 4.0. Sharing of resources across various services is the model of smart cities and this can be executed with the blockchain technology thus cutting down on transaction cost and manage data accountability and immutability. Extensive research is being done to make blockchain adaptable in the areas of education, taxation, insurance and power sector.

### **Cross Border Transactions (CBT)**

In a traditional cross border transaction, more than two banks are involved and it is the SWIFT messages that ensure that the transactions of debit entry in one bank's ledger is communicated to the receiving bank so as to make appropriate changes in the credit entry of the receiving bank. The time taken for settlement in a single cross border payment is high as it involves a series of activities like receiving, collating and netting payment messages before confirmation/denial messages are sent to the respective banks. Issues related to risk and security in pooled accounts in some banks pertains to the possibility of modifications that can be made at the originator's end which may cause data protection and security challenges at the other end of the receiving bank.

### **Present model of CBT**

Blockchain technology in cross-border payments enable secure and fast transfers between multiple bank ledgers by bypassing several intermediaries. The existing and widely used SWIFT and SWIFT-gpi operates uni- directional and is not connected to any underlying settlement process system. This has resulted in several cases of frauds and unauthorized transactions. Blockchain solution enable instant remittance services. Financial messaging provider SWIFT (Society for Worldwide Interbank Financial Telecommunication, founded in the 1970s) supports B2B cross border payments since 40 years. SWIFT

supports cross-border payments through correspondent banking system where more than two banks are involved in moving payments from the payer's account to the recipient.

More than 11,000 financial institutions use the service worldwide in more than 200 countries and territories, making it possible to transfer money to and from practically every country. Customers see existing payment system in banks as expensive, slow and opaque. The existing system has several limitations:

Interoperability challenges. SWIFT charges both receiving and payment banks for processing transactions and that is definitely high.

Many banks lack size and resources to integrate multiple networks. Ensuring sufficient liquidity in nostro accounts with central banks is also a prerequisite which is a limitation in some banks.

Transactions such as receiving, collating, netting etc. has to happen in a single cross border payment mechanism, which is now time consuming, incurs high maintenance and switching over costs.

There are also concerns raised over data security and protection, counterparty risks and over dependence on one counterparty.

### **Blockchain technology in cross border remittances - Ripple case study**

The solution to all the impairments in cross border transaction could be enabling it through block chain. Ripple system (Ripple Net) is one such system which provides bidirectional and multi-party validated transaction platforms. Ripple Net is the first neutral settlement infrastructure, a Global RTGS that settles multiple currencies. Networks of banks and clearing houses use this platform to facilitate increased efficiency and interoperability. This becomes more economical with use of self-generated coins such as XRP (ripple's digital asset) which helps in sourcing liquidity real-time at an optimum cost and reduced forex volatility. Therefore, the benefits are foreign exchange and payment delivery systems for banks, real time payments for companies and new and low cost offerings for customers. Ripple is not listed on all crypto exchanges. Coinbase facilitates buying bitcoins or Ethereum, transferring this to exchange Binance and to get ripple. Ripple Company owns 100b ripple units and price of every unit depends on respective supply and demand. RippleNet provides a platform for cross border payments using XRP and works directly with big banks and not trying to work against them.

Ripple is a financial real-time gross settlement solution (RTGS) , currency exchange and remittance network using distributed ledger technology – partnership with Society for Worldwide Interbank Financial Telecommunication (SWIFT). It operates in multi currencies including USD, euros, RMB, yen, gold, airline miles, and rupees. Transfer of money between one country to another takes just three to four sec and at a comparatively less cost/charges/fees.

Ripple is the first neutral bilateral settlement infrastructure.

Neutral and is currency agnostic just like email and other standards.

It shows no preference to any country, jurisdiction or system.

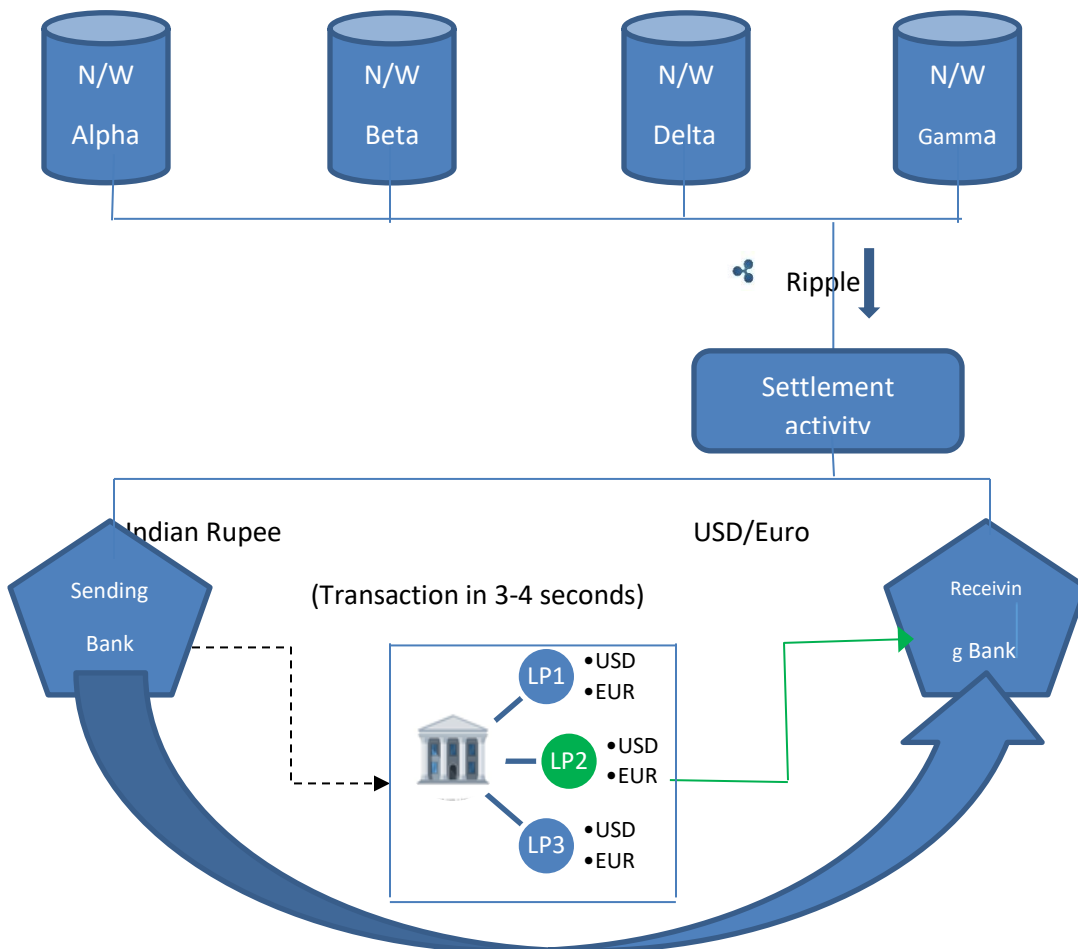
Ripple does not replace any existing networks.

Networks, banks and clearing houses to enable increased efficiency and interoperability through a common platform

It operates through an open Internet protocol-based technology.

The National Bank of Abu Dhabi (NBAD) has adopted ripple for transaction immutability and payment integrity. India based Axis Bank has used it for Cross border payment solutions. Standard Chartered bank has completed its first real time cross border payment and in less than 10 sec with full transparency of fees and FX. Global Payments Steering Group is the first interbank group for global payments on Distributed Ledger Technology (DLT). Bank of America Merrill Lynch, Santander, UniCredit, Standard Chartered, Westpac, and Royal Bank of Canada have joined as founding members of the network. Smart Token Chain (STC), a Blockchain specialist in the FinTech sector, has completed its first full Smart Token transaction across the Ripple Network. STC's can have universal access to partners and customers and need not create a digital relationship with each one. STC benefits from Ripple's open and neutral platform, the "Interledger Protocol" to facilitate global payments across different ledgers and networks. YES bank, which has entered into partnership with Ripple for inbound remittances from North America, Middle East and UK. SBI Remit and SCB use ripple's enterprise.

**Proposed integrated model**



**Source: Authors**

**Steps**

The Sending bank /remitter has to login through core banking or internet banking customer ID.

Selection of option for Transfer of funds- the system displays user account details including ID, available balance, address of Payee, amount to be transferred and remarks.

A permissioned Block chain platform (ex. Ripple) verifies remitter and payee bank details and assigns a unique address to remitter.

The payment gateway then uses consensus network to verify the transactions and authenticates it.

The gateway executes the transaction by choosing a liquidity provider who has quoted the lowest price for currency conversions.

The money is transferred from remitter's banks to payee bank (transactions accounts are respectively debited and credited).All this in a total transaction time of 3-5 seconds.

The integrated model tries to enable banks to settle cross border payments in real time at lower cost and tracking facility which is otherwise too expensive to handle. Banks can source liquidity in real time without even meeting pre-funding requirement in Nostro account. Ripple's algorithm helps in routing settlement transactions through lowest cost foreign exchange provider. It enhances real time settlement by connecting applications-processes-messaging-settlement infrastructure together.

### **The future of CBT using block chain**

Various reports evidence benefits of Blockchain technology adoption and its universality in applications. However, there is no literature to evidence actual applications by Indian banks. Hence, this paper attempts to provide real insights into its adoption by Indian banks. Focused group discussions and interview schedule method was adopted to collect information from bankers. The results of the study reveal the following information about the present system:

Banks are exploring use of block chain technology and its various applications in their business rather than experimenting with it as of now.

Indian banks are conducting awareness programs for their employees and executives on the same while interacting with their technology counterparts to explore the implementation in mainstream core banking.

Majority of them use SWIFT platform for remittances across cross border. They do believe that distributed ledger technology (DLT)/Blockchain gives them an improved model, which helps reduce cost and time processing payments/remittances and enable an effective platform.

Majority of them are involved in creating proof-of-work and proof-of-concept with other intermediaries in ensuring better platform of remittance payment system and are forerunners in revolutionising the concept of real time settlements.

An executive of a lead public sector bank opined that limited information is preventing adoption of technology on a large scale ie in various high end banking operations.

Day-to-day operations such as intra bank transfers, core-banking functions, self-operated pass book entry, and machine addressed grievance mechanisms etc. needs improvement. There is no clarity on how exactly block chain technology can be leveraged to overcome these issues.

Cross-border remittances and interbank transfers using Blockchain technology occupies secondary focus. As of now, they have tested it only for intra bank transfers rather than interbank and cross-border remittances.

Using block chain technology revolutionizes the whole process of interoperability and money transfer. Banks can derive the benefit of low capital cost if Blockchain platforms (example: ripple) is adopted along with low transaction costs, shorter settlement time, minimal errors and hence more revenue opportunities. A payment system to be more effective and to create value should facilitate payment to 'anyone and anywhere' and not necessarily between banks. This requires creating a common network between bank and non-bank including FinTech companies and technology enablers such as google etc. Regulatory and compliance issues act as major barriers towards adoption of Blockchain technology in operations along with security issues. Regulatory bodies have to work around the impediments and device new policy frameworks for ease and effective transactions.

## Conclusion

Banking and financial services sector have identified the uses of block chain technology and have already taken initial steps towards its adoption. However, there is a need for further integration. Added to it, they can set up strategic teams or groups to identify new opportunities, start trial processes and add value to bank operations. Real-world simulations for improving Proof-of-work can be initiated which enables measurement of results and refining or developing new applications. There is also a need for a conducive regulatory environment and standardized formats to ensure data security especially in terms of Anti Money laundering, KYC etc. There is a need to move from permissioned platforms to open independent platforms which enables low transaction time and cost.

The benefit of implementation of block chain technology in bank remittances is to make the service available with the objective of 'anyone to anyone and anywhere'. The futuristic outcome of this paper can be in terms of designing an integrated model to connect banking as well as related service providers such as FinTech, processing agents and central banks to facilitate bilateral and multiple easy access platform in cross border payments.

Based on the suggestions given in this paper, a detailed study on multifaceted applications of block chain technology in banks and FinTech sector can be carried out. A detailed interview of bank and FinTech executives through survey, focused group interview and interview schedules can be carried out to understand the extent of awareness, adoption and integration of the technology amongst various service providers. There is scope for testing the feasibility of applying the technology in various other fields as well.

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