1.Introduction

Cross-border payments refer to financial transactions where the sender and the recipient are located in different countries. These transactions include personal remittances, trade payments, and financial settlements between businesses and institutions. Traditionally, cross-border payments have relied on correspondent banking networks, which involve multiple intermediaries such as banks, clearinghouses, and financial service providers. This traditional system, though widely used, is often slow, costly due to multiple transaction layers, high fees, currency exchange complexities, and regulatory requirements.

Blockchain technology (BCT) has emerged as a transformative solution in the cross-border payments landscape. Blockchain is a decentralized, distributed ledger system that records transactions in a transparent and immutable manner. By eliminating intermediaries and enabling direct peer-to-peer (P2P) transactions, blockchain significantly reduces transaction costs, enhances security, and accelerates payment settlements and provides transparency.

The integration of blockchain in cross-border payments has led to several key advancements. Cryptocurrencies and stablecoins, such as Bitcoin (BTC), Ethereum (ETH), and USD-backed stablecoins (USDT, USDC), allow instant global transactions without relying on traditional banking channels. Smart contracts, self-executing contracts stored on blockchain networks, further automate payment processing by executing transactions only when predefined conditions are met. This reduces the risk of fraud, ensures compliance, and improves efficiency.

Major financial institutions and fintech companies are leveraging blockchain technology to modernize international transactions. Platforms such as Ripple (XRP) and Stellar (XLM) facilitate near-instant remittances at a fraction of the cost of traditional payment systems. Additionally, stablecoins are gaining traction as a bridge between digital assets and fiat currencies, providing liquidity and stability for cross-border transactions.

By addressing inefficiencies in the conventional banking system, blockchain enhances transparency, reduces dependency on intermediaries, and accelerates the settlement process. As financial regulations evolve, blockchain-based cross-border payment solutions continue to reshape global financial transactions, making them more accessible, cost-effective, and secure for individuals and businesses worldwide. [1]

2. Background

2.1 Traditional Cross-Border Payment System

Cross-border payments are vital for global trade, business transactions, and remittances. However, traditional methods are plagued by high costs, slow processing, security risks, and regulatory complexities. While financial technology has improved payment systems, blockchain adoption faces challenges such as intermediary fees, fraud risks, transparency issues, and currency conversion difficulties. Overcoming these barriers is essential for blockchain to become a viable solution for secure and efficient cross-border transactions.[2]

2.2 High Transaction Fees in Cross-Border Payments

Traditional cross-border payments involve multiple intermediaries, each charging fees that increase overall transaction costs. Banks, correspondent networks, and receiving institutions all impose charges, making smaller transactions especially expensive. These high fees reduce the value of payments and discourage the use of formal financial channels, particularly in underbanked regions.

2.3 Delays in Cross-Border Transactions

Traditional cross-border payments can take several days due to intermediary processes, currency conversions, and time zone differences. Limited banking hours further slow transactions, causing delays that frustrate businesses and individuals needing quick access to funds.

2.4 Fraud and Security Risks

Traditional cross-border payments involve multiple intermediaries, increasing vulnerability to fraud, hacking, and data breaches. High-value transfers are especially at risk, with threats like identity theft and money laundering making transactions less secure.[2]

2.5 Lack of Transparency

Traditional cross-border payments lack transparency due to multiple intermediaries, making it difficult to track transactions. This opacity leads to disputes, errors, and delays, as participants must rely on intermediaries rather than independently verifying fund movements.[2]

2.6 Currency Conversion

Exchange rate fluctuations and conversion fees make cross-border payments costly and unpredictable. Currency values change daily, leading to potential financial losses for senders and recipients. Banks and financial institutions further add to costs by charging high conversion fees, complicating transactions across multiple currencies.

3. Blockchain Basics

Blockchain technology has the potential to significantly improve cross-border payments by addressing many of the inefficiencies present in traditional systems. Here's a simplified overview based on insights from various high-quality sources

Some Blockchain key Aspects:

1. Decentralization

Blockchain operates as a decentralized ledger, recording all transactions across a distributed network of nodes. Unlike traditional payment systems, where banks and financial institutions act as intermediaries, blockchain enables direct peer-to-peer transactions, reducing reliance on correspondent banking networks. This decentralization eliminates unnecessary delays, reduces transaction costs, and enhances efficiency in cross-border payments. Additionally, permissioned blockchains, such as those used by financial institutions, offer controlled access while maintaining security and transparency [3]

2. Faster Transactions

Traditional cross-border payments can take several days to settle due to the involvement of multiple intermediaries and complex processes. Blockchain technology enables near-instantaneous transactions by allowing direct peer-to-peer transfers without the need for intermediaries. This reduction in processing time enhances the efficiency of international payments.

3. Enhanced Security and Transparency

One of blockchain's core strengths is its immutability—once a transaction is recorded, it cannot be altered or deleted. This feature significantly reduces fraud, as all payments are permanently logged and accessible for verification. Moreover, blockchain's cryptographic security ensures that sensitive transaction details remain protected from unauthorized access.

Transparency is another key advantage, as all participants in the network can verify transactions in real-time. This reduces disputes, enhances trust, and ensures greater accountability in cross-border payments. Public blockchains like Bitcoin and Ethereum offer full transparency, while enterprise solutions like Corda and Quorum provide customizable privacy settings for financial institutions.

4. Smart Contracts

Smart contracts are self-executing agreements stored on a blockchain, with terms directly encoded into the contract. In cross-border payments, smart contracts automate the verification and settlement processes, eliminating the need for manual intervention. Once predefined conditions are met (e.g., recipient verification and currency conversion approval), the payment is automatically processed. This automation reduces processing time, minimizes human error, and ensures compliance with international regulations.

Ethereum and Hyperledger Fabric are two blockchain platforms widely used for implementing smart contracts in financial transactions. Their programmability and security features make them ideal for automating payment flows, dispute resolution, and real-time settlements.

5. Tokenization and Digital Currencies

Blockchain enables tokenization, where real-world assets, including fiat currencies, are represented as digital tokens on a blockchain. This eliminates the complexities of currency conversion by allowing cross-border transactions to be settled in a single, standardized digital currency. Stablecoins like USDC, USDT, and central bank digital currencies (CBDCs) provide a stable alternative to volatile cryptocurrencies and traditional fiat transactions.

By leveraging tokenization, financial institutions can streamline remittances, reduce exchange rate fluctuations, and improve liquidity management. Platforms like RippleNet use XRP for seamless cross-border transactions, while JPM Coin facilitates instant payments between institutional clients.

4. Use Case Overview

Cross-border payments involve financial transactions between parties in different countries. Traditional methods rely on **banks, SWIFT networks, and payment processors**, leading to **high fees, slow processing times, security risks, and lack of transparency**. Blockchain technology offers a decentralized solution to address these inefficiencies.

4.1 Blockchain Technologies in Use:

1. **Ripple (XRP)** – Provides near-instant international transactions with minimal fees.
2. **Stellar (XLM)** – Facilitates low-cost remittances and financial inclusion.
3. **CBDCs & Stablecoins** – Ensure price stability while enabling blockchain-based payments.
4. **Smart Contracts** – Automate transactions, ensuring compliance and reducing disputes.

4.2 System Architecture

The blockchain payment system consists of multiple layers:

1. **User Layer** – Initiates and receives payments.
2. **Smart Contract Layer** – Defines payment conditions and execution logic.
3. **Consensus Layer** – Validates transactions through distributed nodes.
4. **Data Storage Layer** – Uses a decentralized ledger to store transaction data securely.

Real-time data synchronization across nodes eliminates intermediary dependence, simplifying payments and improving **security, fault tolerance, and transparency**.

4.3 Payment Process

1. **Payment Initiation** – User sends payment request.
2. **Transaction Verification** – Smart contract checks balance and authentication.
3. **Settlement Execution** – Consensus mechanism confirms transaction and records it on the blockchain.
4. **Result Confirmation** – User receives real-time transaction status.

The decentralized process **shortens transaction time and increases transparency**, allowing users to track payments instantly.

4.4 Consensus Mechanism Optimization

Consensus mechanisms impact payment efficiency and security:

1. **Byzantine Fault Tolerance (BFT)** – Best for small, high-trust networks with fast confirmation.
2. **Proof of Stake (PoS)** – Suitable for large-scale payment systems, offering stability and lower energy consumption.
3. **Hybrid Approach** – A combination of PoS for large networks and BFT for smaller nodes improves efficiency and security.

Malicious activity is mitigated through **penalty scoring mechanisms**, ensuring network stability.

4.5 Smart Contract Applications

Smart contracts automate transaction processes, reducing the need for intermediaries. Key applications include:

1. **Exchange Rate Conversion** – Automates currency conversion at real-time rates.
2. **Account Balance Verification** – Ensures users have sufficient funds before processing.
3. **Conditional Execution** – Transactions are completed only when predefined conditions are met.

To **ensure security**, smart contracts require **rigorous testing and a double-confirmation mechanism** to minimize execution risks.

4.6 Security and Compliance

To maintain security and regulatory compliance, blockchain payment systems implement:

1. **Encryption & Multi-Signatures** – Prevent data tampering.
2. **AML (Anti-Money Laundering) & KYC (Know Your Customer)** – Ensure user identity verification.
3. **On-Chain & Off-Chain Data Integration** – Supports transparent management and regulatory oversight.

4.7 How Blockchain Works?

4.7.1 Blockchain ensures security in cross-border payments:

In the past, banks handled cross-border payments using centralized systems that relied on intermediaries. These intermediaries collected customer information, such as account details, to process transactions. However, verifying the trustworthiness of these intermediaries was

difficult, and there was a risk of customer data being leaked. To reduce these risks, banks had to develop advanced payment systems for their partner banks and set up separate reserve accounts for different payment networks. Refer to Fig 4.1.

Traditional online payment systems rely on third-party financial institutions to manage transaction records securely. However, security is often maintained manually, making systems vulnerable to hacking or server failures. If attackers exploit these weaknesses or servers crash, it can threaten financial security, risking user transactions and data integrity.[4]

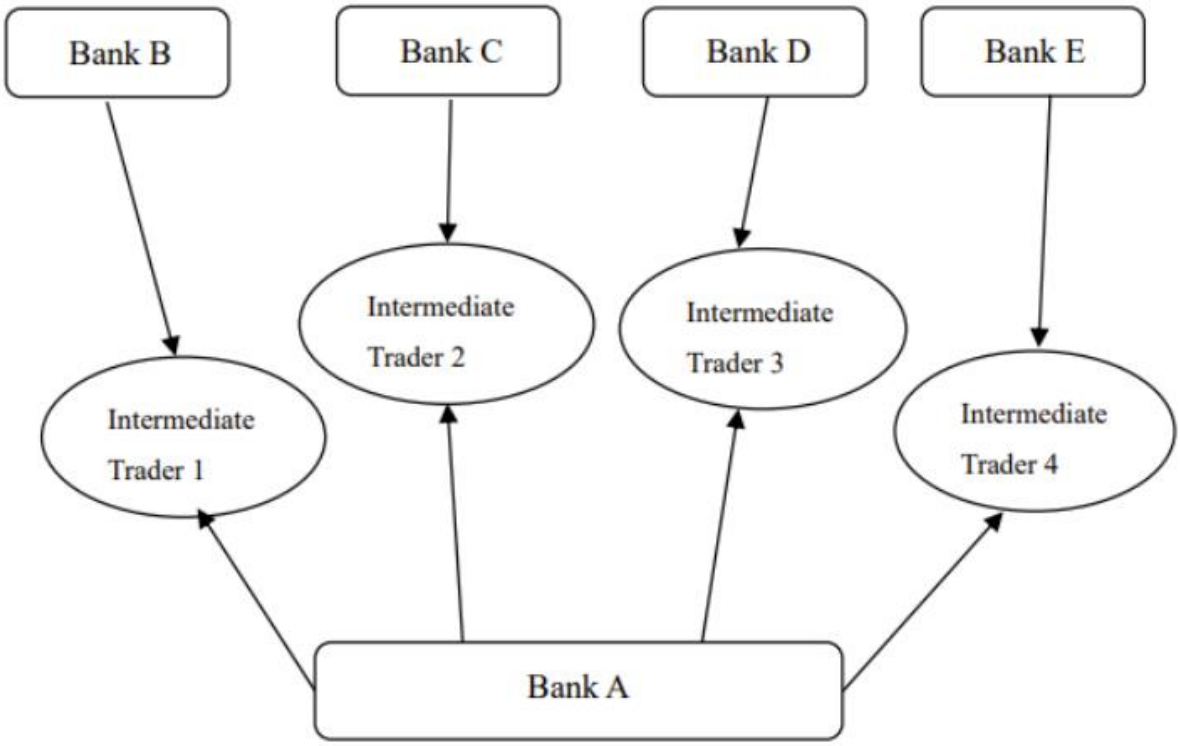


Fig 4.1 Tradition Payment [4] (Page No:11)

Fig 4.2 tells that in blockchain-based payment systems, banks use **private blockchains** to process transactions efficiently without relying on third-party banks. This eliminates the need for intermediary banks and multiple reserve accounts, reducing costs and improving transaction speed.

Blockchain's **decentralized ledger** ensures each node maintains a full transaction history, preventing system failures from compromising security. Transactions are **tamper-proof, transparent, and irreversible**, reducing fraud and enhancing trust. By removing intermediaries, blockchain lowers costs and increases efficiency while ensuring all participants have equal access to transaction data, improving transparency in cross-border payments.[4]

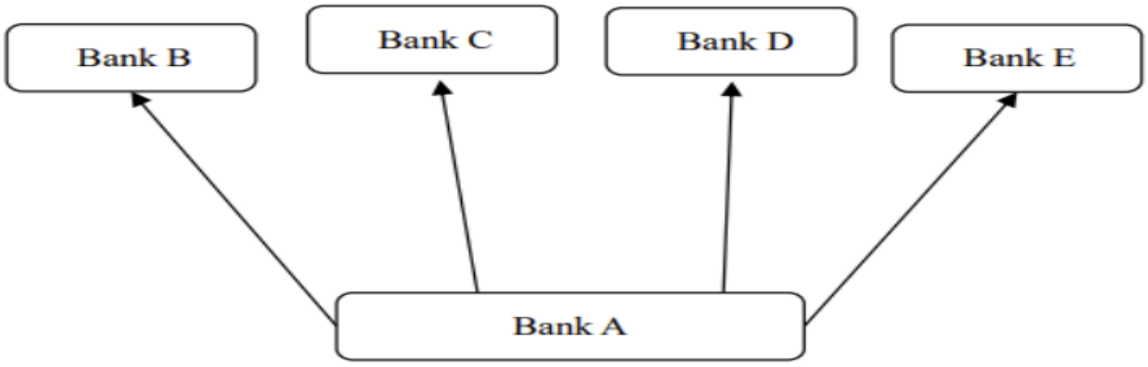


Fig 4.2 Blockchain Payments Methods [4] (page:11)

4.7.2 Blockchain Technology Facilitates the Swift Advancement of Digital Currencies:

The rise of **blockchain technology** has led to the emergence of **digital currencies**, such as **Bitcoin**, marking a major shift in financial systems. Unlike traditional currencies issued by central and commercial banks, some digital currencies, like **Bitcoin and Libra**, operate as **private digital currencies** without central control. Since Bitcoin's launch in **2009**, the cryptocurrency market has seen rapid growth, revolutionizing digital finance. Figures 4.3 and 4.4, based on data from the global cryptocurrency trading platform Coinmarketcap (www.coinmarketcap.com) as of February 2024, illustrate the global Bitcoin market prices and market capitalization.

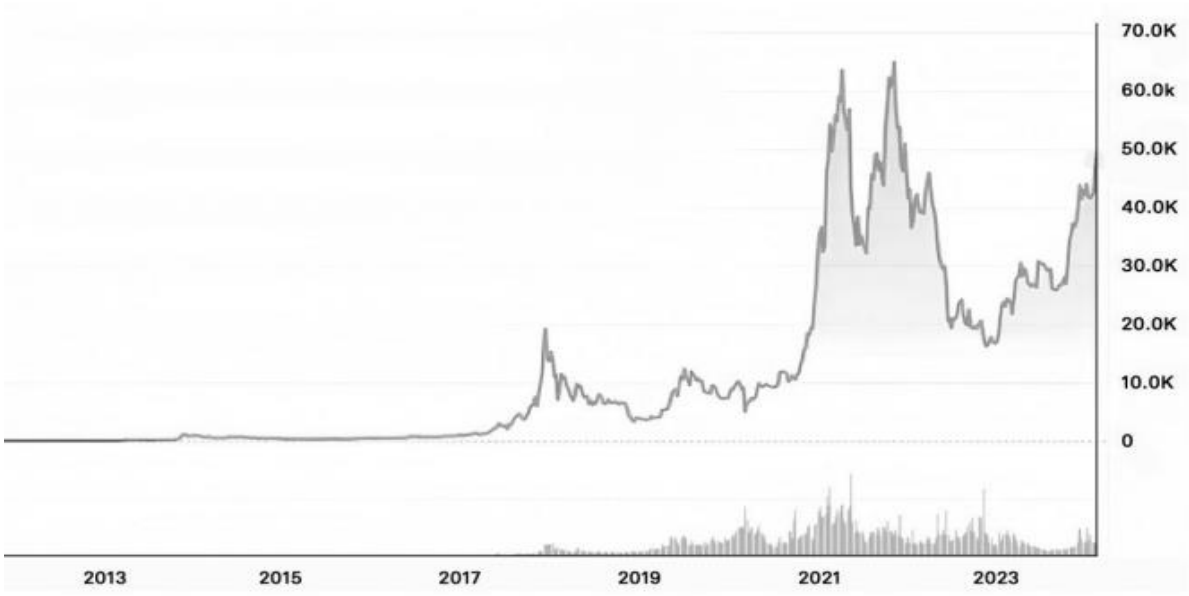


Fig 4.3 Global Bitcoin Market Prices Data Source: Coinmarketcap[4]

(page:13)

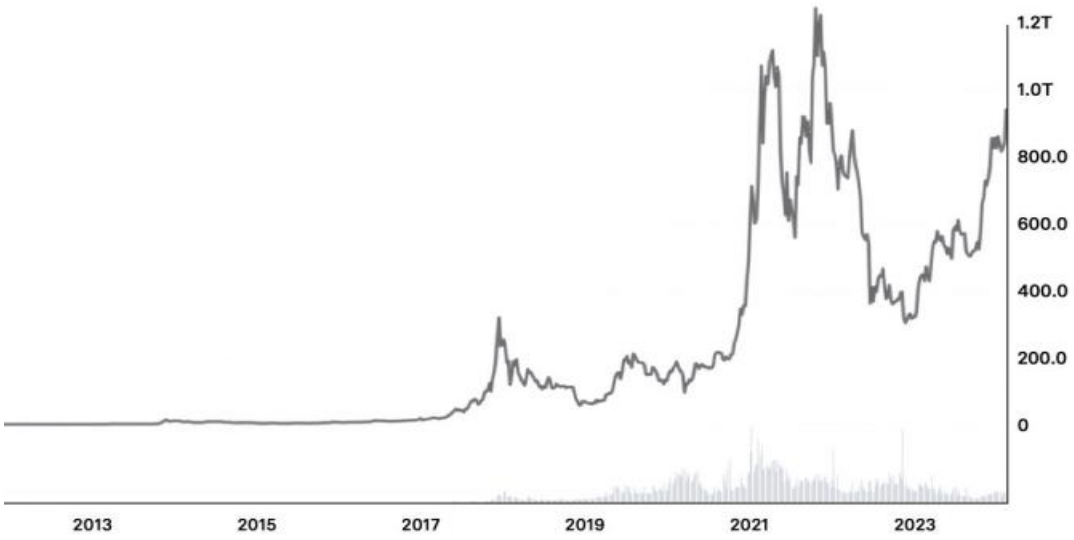


Fig 4.4 Global Bitcoin Market Value Data Source: Coinmarketcap [4] (page:13)

Fig 4.3, tells Between 2017 and 2024, Bitcoin's market value saw major spikes, notably in late 2017 and early 2021, driven by public interest, media coverage, and investor recognition. Fluctuations followed, influenced by regulatory changes, technological advancements, and macroeconomic factors. Fig 4.4, provides Bitcoin's **market capitalization** is determined by multiplying the total Bitcoins in circulation by its market price, showing a strong correlation between price and value trends. **Blockchain technology** has revolutionized digital currencies, enhancing monetary circulation efficiency beyond traditional banking and payment systems. Its potential extends to **accelerating currency movement across markets**.

5. Implementation

5.1 Smart Contracts

Smart contracts are **self-executing agreements with predefined conditions** written in code and deployed on a blockchain. They automatically execute transactions once the conditions are met, eliminating the need for intermediaries. In cross-border payments, smart contracts enable **faster, more secure, and cost-effective transactions** by automating processes such as fund transfers, currency conversions, and regulatory compliance checks.

Examples of Platforms Using Smart Contracts for Cross-Border Transactions:

1. **Ethereum (ETH)**: Most widely used for smart contracts in payments.
2. **Algorand (ALGO)**: Used for high-speed cross-border transactions.
3. **Hyperledger Fabric**: Enterprise-grade blockchain for international financial transactions

5.1.1. How Are Smart Contracts Used in Cross-Border Payments?

In cross-border payments, smart contracts automate and secure money transfers between two parties in different countries.

Example: Sending Money from the USA to India Using a Smart Contract

1. Alice (USA) wants to send $100 to Bob (India).
2. She deposits $100 USDT into a smart contract.
3. The Smart Contract checks:
    - Did Alice send the correct amount?
    - Is Bob's wallet address valid?
4. Once verified, the contract **a**utomatically releases the $100 USDT to Bob in India.
5. Bob receives the money without needing a bank.

5.1.2. What Is Required to Create Smart Contracts for Cross-Border Payments?

To develop a smart contract, you need:

1. Blockchain Platform:

Choose a blockchain that supports smart contracts:

- Ethereum (ETH) – Most widely used
- Stellar (XLM) – Built for payments
- Ripple (XRP) – Optimized for banks and remittances

2. Smart Contract Programming:

Smart contracts are written in Solidity (Ethereum) or Rust (Solana).

3. Oracle Services (For Currency Conversion):

Since blockchain doesn't know real-world exchange rates, smart contracts use oracles like:

- Chainlink
- Band Protocol

4. Compliance & KYC (For Regulated Transactions):

- Some smart contracts include KYC/AML (Know Your Customer / Anti-Money Laundering) checks before processing payments.

5.2 Ethereum-Compatible Smart Contracts

5.2.1 What Are Ethereum-Compatible Smart Contracts?

Ethereum-compatible smart contracts are self-executing programs deployed on **Ethereum Virtual Machine (EVM)-compatible** blockchains. They operate without intermediaries, ensuring transactions follow predefined rules **automatically and transparently**.

5.2.2. Why Use Ethereum-Compatible Smart Contracts for Cross-Border Payments?

Ethereum-based smart contracts provide key advantages for **international transactions**:

1. **Automation:** Transactions are executed instantly when conditions are met, reducing delays.
2. **Security:** Smart contracts are **immutable** (cannot be altered), ensuring **trust** in cross-border payments.
3. **Transparency:** Every transaction is **publicly recorded** on the blockchain, preventing fraud.
4. **Interoperability:** Many blockchain networks (e.g., Binance Smart Chain, Polygon, Avalanche) are **EVM-compatible**, allowing seamless integration between different platforms.
5. **Cost Efficiency:** Eliminates intermediaries (e.g., banks, payment processors), reducing transaction fees.

5.2.3. How Are Smart Contracts Implemented in Cross-Border Payments?

A cross-border payment system using Ethereum-compatible smart contracts works like this:

1. **User Initiates Payment:** The sender submits a transaction request via a blockchain-based payment gateway.

2. **Smart Contract Validation:** The contract verifies **identity, compliance (AML/CFT), and currency conversion rates**.
3. **Fund Locking:** The sender's funds are locked in the smart contract until conditions are met.
4. **Transaction Execution:** If all conditions are satisfied (e.g., regulatory checks, recipient verification), the funds are released to the recipient.
5. **Final Settlement:** The transaction is **recorded on the blockchain**, providing an immutable proof of payment.

`DbtrInstruction` struct in the smart contract.

```
struct DbtrInstruction {
    Amount IntrBkSttlmAmt;
    address DbtrAgt;
    string DbtrAcct;
    string DbtrAgtIsoMsg;
    address NxtAgt;
}
```

For this specific data structure, the web client extracts the required information from the XML-formatted `pacs.008` message using the following Python function, where the specific attributes correspond directly to the ISO20022 data schema to facilitate ease of integration and maintain consistency. This implementation enhances interoperability and compatibility with external systems and messaging standards by standardizing transactional data formats.

```
def get_debtor_instructions(xml_data):

    dict_data = convert_to_dict(xml_data)

    dbtr_instruction = {
      "IntrBkSttlmAmt": dict_data['Document']
            ['FIToFICstmrCdtTrf']['CdtTrfTxInf']
            ['IntrBkSttlmAmt'],
      "DbtrAgt": dict_data['Document']
            ['FIToFICstmrCdtTrf']['CdtTrfTxInf']
            ['DbtrAgt']['FinInstnId']['BICFI'],
      "DbtrAcct": dict_data['Document']
            ['FIToFICstmrCdtTrf']['CdtTrfTxInf']
            ['DbtrAcct']['Id']['Othr']['Id'],
      "DbtrAgtIsoMsg": xml_data,
      "NxtAgt": dict_data['Document']
            ['FIToFICstmrCdtTrf']['GrpHdr']
            ['InstdAgt']['FinInstnId']['BICFI']
    }

    return dbtr_instruction
```

Fig 5.1 Example structure of transaction in solidity and python function to extract xml format inti standard ISO20022 [5] (page:2)

6. Benefits

Blockchain technology is transforming cross-border payments by solving key challenges in traditional systems. It enhances security, transparency, speed, efficiency, and cost-effectiveness, while also enabling decentralized currency solutions and automated transactions through smart contracts.

1. Security and Transparency

- Blockchain uses a decentralized and tamper-proof ledger, making transactions secure and preventing fraud.
- Every transaction is encrypted, time-stamped, and permanently recorded, ensuring data integrity.
- All parties can track real-time payment status, reducing disputes and increasing trust.

2. Cost Reduction

- Traditional cross-border payments involve multiple intermediaries (banks, payment processors), adding extra fees.
- Blockchain enables direct peer-to-peer transactions, eliminating intermediaries and lowering transaction costs.
- This is especially beneficial for small businesses and emerging markets where financial services are expensive.

3. Speed and Efficiency

- Traditional payments can take days to process, especially with different currencies and banking regulations.
- Blockchain allows near-instant transactions by removing intermediaries.
- This helps businesses in global trade, ensuring timely payments and reducing exposure to currency fluctuations.

4. Decentralized Currency Solutions

- Traditional payments rely on fiat currencies, which are affected by government policies, currency exchange rates, and regulations.
- Blockchain supports digital currencies and stablecoins, which are not tied to a single country's economy.
- Stablecoins (pegged to assets like USD or gold) provide a predictable and stable payment method, avoiding exchange rate volatility.

5. Smart Contracts for Automation

- Smart contracts are self-executing agreements that automate payments when predefined conditions are met.

- They reduce the need for intermediaries like banks, legal firms, and payment processors.
- Example: A smart contract could automatically transfer funds once a service is completed, ensuring trust and reducing fraud.

7. Challenges

Blockchain technology can transform cross-border payments by enhancing security, speed, and efficiency. However, challenges such as regulatory compliance, scalability, integration with existing financial systems, and public perception slow its adoption. Overcoming these barriers is key to making blockchain a mainstream solution for global payments.

1. Regulatory Compliance:

Financial laws vary across countries, covering AML, CFT, tax reporting, and consumer protection. Unclear regulations make compliance complex, leading to legal risks and fines.

2. Scalability:

Public blockchains process transactions slower than centralized systems like SWIFT. While solutions like sharding and layer-2 scaling exist, they are still evolving.

3. Integration with Legacy Systems:

Banks rely on centralized payment infrastructure. Integrating blockchain requires high investment, time, and technical expertise, discouraging financial institutions.

4. Public Trust & Security:

Blockchain is linked to cryptocurrency risks, cyberattacks, and complexity. Security breaches and lack of understanding fuel skepticism.

5. Cryptocurrency Volatility:

Rapid price fluctuations in crypto payments cause financial uncertainty. Stablecoins offer potential stability but are not yet widely used.

8. Conclusion

Blockchain technology has the potential to revolutionize cross-border payments by reducing transaction costs, increasing security, and enhancing transparency. However, its adoption is hindered by several key challenges, including regulatory uncertainties, scalability constraints, integration difficulties with legacy financial systems, and public skepticism.

Regulatory compliance remains one of the most significant obstacles, as financial laws vary widely across countries, requiring businesses to navigate complex legal landscapes to ensure compliance with AML, CFT, tax regulations, and consumer protection laws. Scalability issues further limit blockchain's ability to process large volumes of transactions efficiently, making it difficult to compete with traditional systems like SWIFT. Moreover, the integration of blockchain into existing banking infrastructure is costly and time-consuming, requiring major technical advancements to ensure seamless interoperability.

Public perception and trust are also critical factors influencing blockchain adoption. The association of blockchain with cryptocurrencies, security vulnerabilities in some platforms, and the high volatility of digital assets create uncertainty among businesses and consumers. Although stablecoins offer a potential solution to price fluctuations, they are not yet widely adopted or regulated.

To fully harness the benefits of blockchain in cross-border payments, stakeholders—including governments, financial institutions, and technology developers—must work together to create clear regulatory frameworks, develop scalable solutions, and improve public awareness. Continued innovation in blockchain technology, along with strategic partnerships between traditional financial institutions and blockchain-based platforms, will be essential in overcoming these barriers. By addressing these challenges, blockchain can pave the way for a more efficient, secure, and inclusive global financial system.

9. SDG's

1. SDG 1: No Poverty

Justification:

- Blockchain reduces high remittance fees, making cross-border payments cheaper for **low-income families** who rely on remittances from abroad.
- Faster transactions ensure that funds reach recipients **without long delays**, helping people in developing nations access money when they need it.

Real-World Example:

- **Stellar (XLM)** enables **low-cost remittances**, helping **underbanked communities** receive money with minimal fees.
- **UN's World Food Programme (WFP)** has used blockchain-based payments to distribute aid directly to refugees in Jordan, reducing costs and fraud.

2. SDG 8: Decent Work and Economic Growth

Justification:

- By streamlining global payments, blockchain helps **small businesses** and **freelancers** receive payments efficiently, boosting international trade.
- Smart contracts automate payments, reducing fraud and enhancing transparency in cross-border transactions.

Real-World Example:

- **RippleNet (XRP)** has partnered with banks to **enhance global remittances** and support economic growth by ensuring **secure, instant payments**.
- **Ethereum-based smart contracts** help freelancers in **developing countries** receive direct payments without intermediaries.

3. SDG 9: Industry, Innovation, and Infrastructure

Justification:

- Blockchain creates **a decentralized financial system**, reducing reliance on **traditional banking infrastructure**.
- It enhances **financial inclusion** by providing payment solutions for the unbanked and underbanked populations.

Real-World Example:

- **Central Bank Digital Currencies (CBDCs)** are being tested in multiple countries to **modernize financial infrastructure**.

- **IBM Blockchain World Wire** helps banks settle payments instantly, removing inefficiencies in legacy systems.

4. SDG 10: Reduced Inequalities

Justification:

- Traditional banking systems exclude millions of people due to high fees and lack of access. Blockchain allows **borderless transactions**, enabling **financial inclusion**.
- Stablecoins reduce currency volatility, helping people in countries with unstable economies to **preserve wealth and conduct secure transactions**.

Real-World Example:

- **Celo blockchain** provides mobile-based financial services to people in **Africa and Latin America**, increasing economic participation.
- **USDC and USDT stablecoins** allow Venezuelans to protect their savings from hyperinflation by storing value in **stable digital assets**.

5. SDG 16: Peace, Justice, and Strong Institutions

Justification:

- Blockchain provides **transparent, tamper-proof records**, reducing corruption in financial transactions.
- Smart contracts ensure payments are **executed fairly**, preventing fraud and disputes in international trade.

Real-World Example:

- The **European Union** is exploring **blockchain-based anti-money laundering (AML) solutions** to enhance financial security.
- **Hyperledger Fabric** is being used by banks for **KYC (Know Your Customer) and AML compliance**, improving fraud detection.

10. References

[1] Cross-Border e - Commerce Payment Risk Based on Blockchain Underlying Technology (https://link.springer.com/chapter/10.1007/978-981-99-9538-7_6?utm_source=chatgpt.com)

[2] Aumbur Kwaghter Sule ,Jan 2025,**(Implementing Blockchain for Secure and Efficient Cross-Border Payment Systems)**

https://rsisinternational.org/journals/ijrias/articles/implementing-blockchain-for-secure-and-efficient-cross-border-payment-systems/ - visited

[3] Deloitte - Cross-border Payments on Blockchain Enabling Business-to-Business and Person-to-Person payments acro

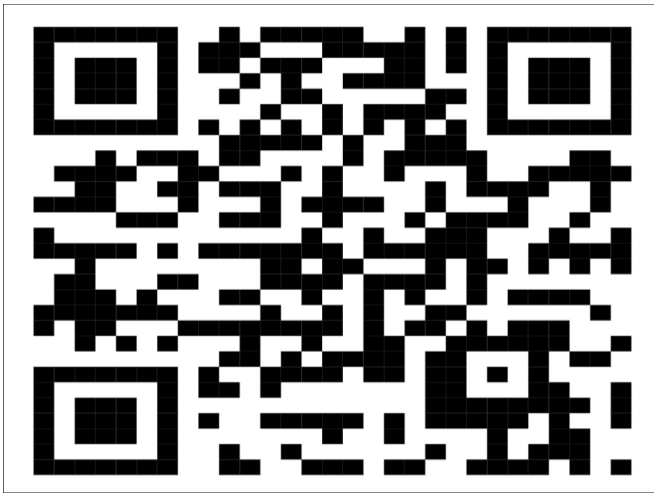
[4] (1College of Liberal Arts, University of Minnesota, 101 Pleasant St SE, Minneapolis, The United States) - The_Impact_of_Blockchain_Technology_Cross-Border_P.pdf (10-14) - visited

[5] [Maruf Ahmed Mridul Department of Computer Science Rensselaer Polytechnic Institute Troy, NY, USA) https://arxiv.org/pdf/2407.19283 - visited

[6] Research on Cross border Payment System Based on Block- chain: Efficiency Improvement and Cost Optimization (https://ojs.usp-pl.com/index.php/fm/article/view/13923/13326)

[7] Blockchain-Technology Chandramouli-university press (blockchain-technology chandramouli - university press.pdf - Google Drive) -page

11.Appendix



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