

## Cash Exchange – Peer-To-Peer Currency Exchange System

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### Abstract:

In the digital era, the demand for secure and accessible peer-to-peer (P2P) financial systems is rapidly increasing. Traditional currency exchange methods often incur high transaction fees and delay processing, especially for cross-border transactions. Cash Exchange is a platform developed to offer users a fast, secure, and low-cost method to exchange cash using a P2P model. The platform features real-time exchange rates, fraud prevention, and user verification, and supports multiple payment options. This paper presents the architecture, implementation, and advantages of Cash Exchange and outlines its future potential in the FinTech space. The global increase in cross-border transactions has highlighted the need for efficient, low-cost, and secure currency exchange platforms. Traditional systems suffer from high fees, processing delays, and limited accessibility. This paper proposes **Cash Exchange**, a digital peer-to-peer (P2P) platform that facilitates real-time, secure, and low-cost currency exchanges. The platform leverages modern web technologies, robust security protocols, and real-time APIs to create a trustworthy environment for individuals and businesses. The system also ensures compliance with financial regulations through integrated KYC and AML procedures. The paper outlines the architecture, implementation methodology, and future scope of the platform, emphasizing its potential impact on global currency exchange.

### I. INTRODUCTION

Cash Exchange is a digital platform aimed at facilitating peer-to-peer currency exchange with minimal costs and maximum transparency. The platform solves common issues in traditional systems such as high fees, long wait times, and security risks. This system integrates modern technologies including real-time APIs, digital wallets, and user authentication mechanisms. Its objective is to empower individuals and small businesses with a reliable and secure method for exchanging cash without relying on traditional financial intermediaries. Currency exchange is essential in global trade, tourism, and international remittance. However, conventional systems are often burdened by excessive fees, lack of transparency, and delays. **Cash Exchange** is a proposed solution designed to address these issues through a **secure, decentralized, and user-centric platform** that facilitates peer-to-peer (P2P) currency transactions. The platform offers real-time currency rates, reduced transaction fees, and advanced fraud prevention mechanisms.

### II. LITERATURE SURVEY

| Title of Paper           | Methods/Techniques Used   | Analysis and Observation                                      |
|--------------------------|---|---|
| Digital Wallet Solutions | Use of centralized digital payment systems like PayPal and Wise | Offers convenience but lacks decentralization and may include |

|                                  |   |  |
|----------------------------------|---|--|
|                                  |   | hidden fees.   |
| Blockchain for Currency Exchange | Use of Ethereum, smart contracts, and DEXs                  | Promotes decentralization but not ideal for fiat due to volatility and complexity. |
| P2P Money Transfer Systems       | Platforms like Paxful and Remitly with direct user matching | Affordable but riskier due to lack of trust mechanisms.                            |
| Hybrid FinTech Models            | Combines centralized security with P2P architecture         | Ideal for achieving both control and efficiency; limited adoption so far.          |

### III. PROPOSED METHODOLOGY

The Cash Exchange platform is designed using a modular, scalable architecture. The frontend is built using React.js for dynamic user experience. The backend uses Node.js and Express.js to handle transactions, authentication, and API calls. MongoDB is used as the primary database for storing user and transaction data.

Core Functionalities:

- User authentication with KYC verification
- Real-time exchange rate integration via APIs
- Peer-to-peer matching and escrow logic
- Transaction security using JWT and SSL
- Admin panel for user and exchange monitoring

The development of the **Cash Exchange** platform follows a modular and layered architecture designed for scalability, security, and performance. The methodology is structured into key components that collectively ensure efficient peer-to-peer (P2P) currency transactions.

#### 1. System Architecture

The platform is divided into three main layers:

- **Frontend Layer (Client-side):** Built using **React.js**, it provides a responsive and user-friendly interface for users to register, log in, view exchange rates, and initiate transactions.
- **Backend Layer (Server-side):** Developed using **Node.js** and **Express.js**, it handles the core business logic, user

authentication, transaction management, and communication with third-party services.

- **Database Layer:** Utilizes **MongoDB** (NoSQL) and **AWS RDS** (SQL) for storing user data, transaction logs, and system settings securely.

### 2. Core Modules and Workflows

- **User Authentication & KYC Verification:**

Users register and authenticate through JWT tokens or OAuth 2.0. KYC documents are uploaded and verified using secure APIs to ensure platform compliance.

- **Real-Time Exchange Rate Integration:**

The system fetches updated currency rates using APIs such as **Open Exchange Rates** or **XE**. These rates are used to calculate equivalent exchange values between two users.

- **P2P Matching Engine:**

This module matches users based on exchange preferences such as currency type, amount, and location. A matching algorithm ensures optimal pairing and rate agreements.

- **Transaction Handling and Escrow:** Once matched, funds are held in an **escrow-like wallet** until both users confirm the transaction. This prevents fraud and promotes trust.

- **Payment Gateway Integration:** APIs such as **Razorpay**, **PayPal**, or **Stripe** are used to process payments securely. Multi-currency wallets are also supported.

- **Admin Panel:** An administrative interface enables monitoring of transactions, user activities, fraud detection, and regulatory compliance checks.

### 3. Security Measures

- **End-to-End Encryption:** All data exchanged between client and server is encrypted using **SSL/TLS protocols**.

- **Two-Factor Authentication (2FA):** Users are encouraged to enable 2FA for enhanced login security.

- **Fraud Detection Engine:** Transaction patterns are analyzed to flag suspicious activity using rule-based checks and (optionally) machine learning models.

- **Role-Based Access Control (RBAC):** Different access levels are defined for users, admins, and system bots to minimize data exposure.

#### 4. Development Methodology

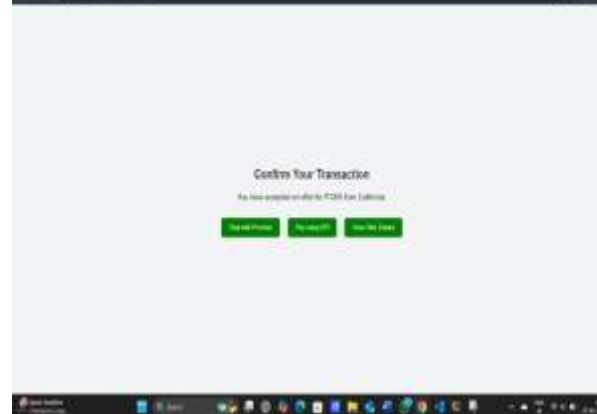
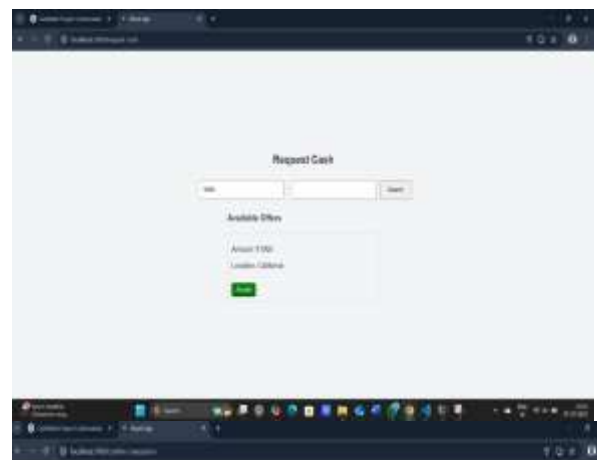
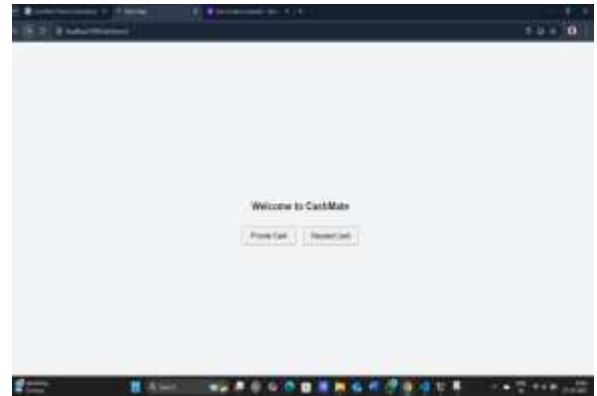
The platform is built using **Agile development practices**, including:

- Iterative design and prototyping
- Continuous integration and deployment (CI/CD)
- Unit and integration testing using Jest and Postman
- Regular user feedback and incremental enhancements

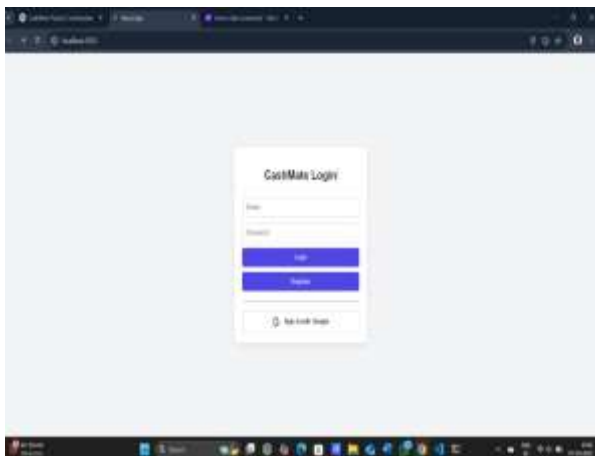
#### 5. Deployment Strategy

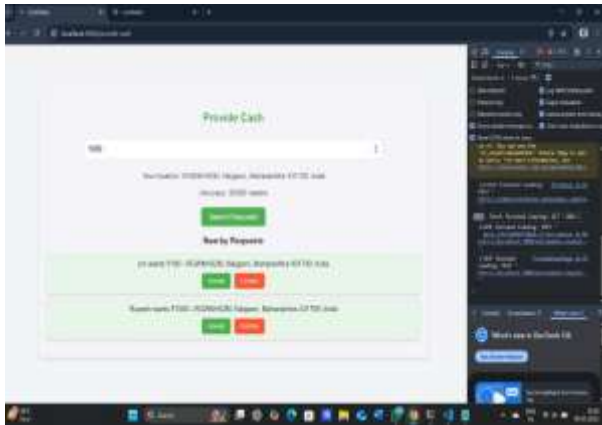
The application is deployed on **Amazon Web Services (AWS)** using:

- **EC2** for backend server hosting
- **S3** for static frontend file storage
- **CloudFront** as CDN for global distribution
- **RDS and MongoDB Atlas** for cloud databases
- **IAM roles and AWS WAF** for secure access control and firewall protection



#### IV. OUTPUT





## VI. CONCLUSION

Cash Exchange is a secure, cost-effective, and user-centric platform for peer-to-peer currency exchange. It addresses the limitations of both traditional and blockchain-based systems by offering a hybrid model that balances decentralization and regulatory compliance. With future enhancements such as blockchain smart contracts and AI-driven fraud detection, the platform holds the potential to become a key player in the FinTech space.

## VII. REFERENCES

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## V. PROJECT REQUIREMENTS

### 4.1 Application Software Requirements

- OS: Windows 10 / Ubuntu 20.04 or higher
- Languages: HTML, CSS, JavaScript, React.js, Node.js
- Database: MongoDB, Firebase, AWS RDS
- APIs: Currency exchange (Open Exchange Rates), Payment gateways (Razorpay, Stripe)

### 4.2 Backend Software Requirements

- Frameworks: Express.js, Django (optional)
- Authentication: JWT, OAuth 2.0
- Security: SSL, AWS IAM, WAF

### 4.3 Hardware Requirements

- Processor: Intel Core i5 or higher
- RAM: 8GB or higher
- Storage: 256GB SSD or more
- Network: Stable broadband (10–100 Mbps)