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Currency Master- Your All In One Currency Converter

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Abstract - Currency is a primary medium of exchange within the times, having way back replaced bartering as a way of trading goods and services. Due to Globalization, there is a tremendous growth of businesses nationally as well as internationally. So, with different nations, they have their different currency values. So, to deal with these fluctuating currency rates, having a mobile application with the latest exchange rates also with a converter which can be accessed anytime anywhere is very helpful. CurrencyX deals with the development of an android- based application for the conversion of different currencies along with getting the latest exchange rates. The main aim of this proposed application is to provide all the features in a single place, accessible anytime anywhere. The application consists of the following modules, namely:(i) Converter (ii)Chart (iii)News (iv)Payment Gateway. The data is fetched through API and the Chart is displayed using the MP Android Chart library. This application can be used by international tourists, forex traders, and analysts.

***Key Words*: Currency, Mobile application, Exchange rates, Android, Chart, News, Forex.**

I. INTRODUCTION

Nowadays, money plays an important factor in various aspects from sociological to economical parts of life. The value of this money varies from country to country depending on the exchange rate value it holds in the global market and also, it is determined by the demand for it, a bit like the worth of products and services [1]. Many people don't concentrate to exchange rates because rarely do they have to. The typical person's lifestyle is conducted in their domestic currency. Exchange rates only inherit a focus for infrequent transactions, like foreign travel, import payments, or overseas remittances [5].
Hence to monitor and analyse the exchange rates of various currencies, many currency exchange systems came into existence. These exchange systems were early available for the companies or various institutions[1]. But as there were advancements in technology, most of the tasks are being on the mobile itself, so currency converter applications with much more features were made the use by people across the globe. Mobile applications made it simpler, accessible anytime and anywhere [2].

A. PROBLEM STATEMENT

As the currency rates always fluctuate it becomes harder to monitor them effectively [1]. A simple Google search is not always a viable option. You have to visit various websites for a reliable piece of information [6]. It's also not easy to track a currency's performance over a while, and if there is a need to transfer money immediately then it's not possible. So, by providing all the currency-related information and the ability to transfer money in one place such as a mobile application, this issue can be solved [2].

B. CURRENCY EXCHANGE SOFTWARE MARKET

With exchange happening in foreign markets volatility has fallen over the past few years since the record levels of liquidity provided by the central banks have calmed the markets, it has left the investors with separate ways to wring a take advantage of the trading currencies. As per the Deutsche bank, the top of 2019 experienced a slowdown across all currencies, including the commodity currencies, the Scandinavian and therefore the EUR crosses, and even GBP, because of major political activities happening lower volatility was seen. On the opposite hand, such a trend has been emerging in Asia with the growing fintech activity and increased investments in Southeast Asia. This has opened an area within the money transfer market with players using technology that can provide transparency on price. 5 billion, offers an answer that uses algorithms to predict which country will need liquidity, when, and top up the bucket accordingly with its own. This has opened an area within the money transfer market with players using technology that can provide transparency on price. 5 billion, offers an answer that uses algorithms to predict which country will need liquidity, when, and top up the bucket accordingly with its own.

Fig -1: Global view of expected growth

C. PROPOSED SYSTEM

This system gathers information regarding the current currency rates, their conversion and trends. The application interacts with the server through API calls with the Database to display the current currency rates and their conversions. Base currency is set by the user. Once the base currency is set by the user, the application provides the user with the currency exchange rates with base currency, the trends regarding the base currency, providing the user with the latest news related to the forex market. Presenting the trends in a Graphical format that can be easily analyzed with access to historical data. Also, provide a payment gateway interface for international transactions.

All of these features are provided within a single Android application which most of the others mobile applications lack. getting exchange rates and trends, News API from newsapi.org, and Razor pay REST API for payment gateway integration. All the APIs used are free to use and open-source. The cost incurred will be at the time of deployment i.e., Play Store, Maintenance and Database setup as Firebase, which will be required if the user pool is higher than expected.

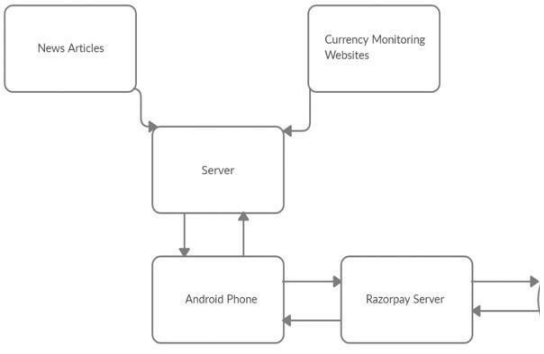

Fig 2: Flow chart of the model

FEASIBILITY

Operational Feasibility: It is the ability to utilize, support, and perform the necessary tasks of a system such as collecting data from various websites, filtering them, and storing them in the database server. As per the user's choice user sets the base currency, then accordingly shows the user the currency exchange rates, trends from the data that is fetched from the database server of currency monitoring websites. Similarly, the news feed is fetched through forex market news- related websites through API calls.

Technical Feasibility: It includes the development of a working prototype of the final mobile application. Android is the most used mobile operating system and availability of good modules with strong customization options, dynamic features, good connectivity. Here we have implemented the project using Java programming language and the Android Studio - which is an open-source Android application development platform that is used to create, design, test and debug Android applications. API's have also been used to fetch data from the sources and display it in the application.

D. RELATED WORK AND MARKET CONTEXT

Existing tools provide partial solutions: web search widgets perform quick conversions; fintech apps handle remittances; market platforms provide charts and feeds. However, **a** unified mobile experience with rate accuracy**,** visual analytics**,** news awareness**,** and transaction capability remains rare in consumer-grade apps. Industry activity in Asia and rising fintech investments have broadened access to transparent exchange pricing, yet consumer tools still tend to silo capabilities (convert vs. analyze vs. pay). Currency Master's contribution is the **integration** of these capabilities with an Android-native, low-latency UX.

E. LITERATURE SURVEY

Currency Conversion Tools: A Comprehensive Review
Author: Sarah E. Williams

Williams provides a detailed review of existing currency conversion tools, analyzing their features, usability, and user experience. The study highlights strengths and weaknesses of different platforms, offering useful insights for individuals and businesses to select efficient and accurate tools for international finance [1].

Mobile Currency Converter Apps: Features and Challenges
Author: Michael J. Davis

Davis reviews mobile currency converter apps, emphasizing real-time updates, intuitive UI, and evolving trends. He also discusses challenges like data accuracy and user privacy, providing guidance for developers and stakeholders to enhance app performance and usability.

User Experience in Currency Conversion Platforms
Author: Emily R. Martinez

Martinez focuses on user experience in currency conversion platforms, covering interface design, navigation, customization, and accessibility. Her findings provide actionable recommendations to improve satisfaction, inclusivity, and usability in future apps like Currency Master [3].

II. RESEARCH HODOLOGY

Here, we have used the Agile methodology for the development of this project. The main reason behind selecting the Agile method is the simplicity of this strategy which is rapid development without too much need of documentation in the case of the android application we need to create, check, correct, rebuild, test continuously, and each time we make changes we'd like to travel through these steps to verify the results of our work. Agile methodology has various roles during the development of software [1]. The regular waterfall methodology includes judging the wants before time with testing and documentation as end steps instead of being crucial as a part of development.

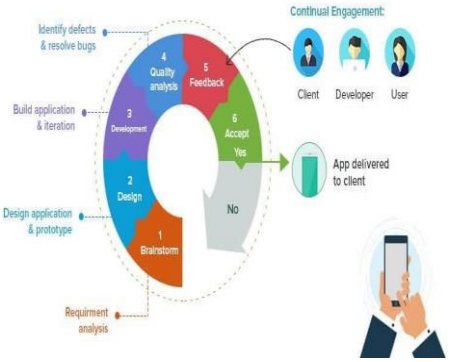

Fig -3: Stages of Agile Development

A. ARCHITECTURE AND TECHNOLOGY STACK

Mobile-First Architecture

- **Client**: Android (Java/Kotlin) developed in Android Studio, structured with MVVM for testability and clear separation of concerns.
- **Data Sources**:
  - Rates API for live and historical FX (normalized to a canonical base).
  - News API (e.g., newsapi.org) filtered for forex topics.
  - Payments API (Razorpay) for transaction initiation.
- **Persistence**: Local Room/SQLite cache for last-known rates, user preferences, and chart snapshots; optional Firebase back-end for telemetry and cohort features as adoption grows [2][3][7].

Data Flow

1. User sets/changes **base currency** → triggers rate fetch (or cache hit) and recalculation for selected quote currencies.
2. **Charts** request historical series (e.g., daily close); data mapped to MP Android Chart datasets.
3. **News** tab queries forex keyword feeds, ranked by recency and source credibility.
4. **Pay** routes the user to the payment gateway flow with prefilled currency context.

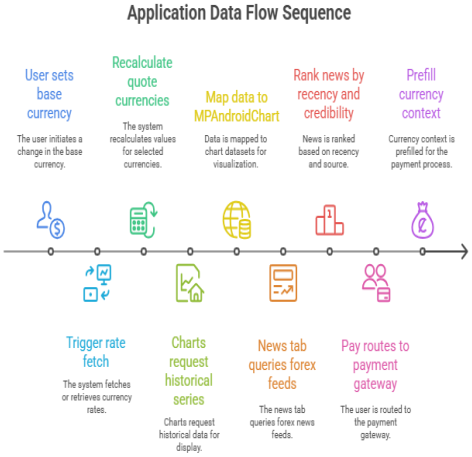

Fig-4: Application Data Flow

API Strategy

- Prefer **HTTPS JSON** endpoints, compact payloads, and ETag/If-Modified-Since headers to minimize bandwidth.
- Retry with **exponential backoff**; circuit-breakers on repeated failures.
- **Key management** via Android Keystore; never hardcode secrets in client builds.
- **Feature flags** allow switching providers with minimal app updates.

III. RESULT AND DISCUSSION

The application comprises the following major modules:

Converter module- The converter module is important as it serves as the homepage of the application. It consists of a list of currencies with their country flag and currency symbol. Euro is the base currency with the other three currencies like the Indian rupee, American dollar, and Australian dollar when the application is launched for the very first time. As the user edits the amount of the base currency in the input, simultaneously the amount value of the other currencies gets updated. The list has 32 international currencies on which the user can add, remove and clear the list of currencies up to his wish.

Default Base and Currencies

- At first launch:
  - **Base Currency** = Euro (EUR, symbol €).
  - **Default List** = Indian Rupee (INR, ₹), US Dollar (USD, $), Australian Dollar (AUD, A$).
- Rationale:
  - These represent **high-frequency use cases** (domestic + international).
  - Provides a balanced mix of Asian, American, and Oceanic economies.

Supported Currencies (Sample 10 out of 32) was shown in the table 1

Table 1: Supports Countries

Currency	Code	Symbol	Example Rate vs. 1 EUR*
US Dollar	USD	$	1 EUR ≈ 1.09 USD
Indian Rupee	INR	₹	1 EUR ≈ 90 INR
Australian Dollar	AUD	A$	1 EUR ≈ 1.63 AUD
British Pound	GBP	£	1 EUR ≈ 0.85 GBP
Japanese Yen	JPY	¥	1 EUR ≈ 162 JPY
Canadian Dollar	CAD	C$	1 EUR ≈ 1.47 CAD
Swiss Franc	CHF	Fr	1 EUR ≈ 0.96 CHF
Singapore Dollar	SGD	S$	1 EUR ≈ 1.45 SGD
Chinese Yuan	CNY	¥	1 EUR ≈ 7.92 CNY
Saudi Riyal	SAR	﷼	1 EUR ≈ 4.09 SAR

Data Handling

- **Input**: User enters an amount in the base currency (e.g., 100 EUR).
- **Computation**: All selected currencies are recalculated simultaneously using the exchange rates fetched from API.
- **Output**: Display shows updated amounts with country flag + symbol for easy recognition.

User Actions Supported

- **Add Currency**: Choose from 32 supported currencies (searchable list).
- **Remove Currency**: Swipe/remove any currency not needed.
- **Clear List**: Reset to base only.
- **Change Base**: Long-press to set another currency (e.g., USD as base instead of EUR).

Usability Insights

- **Flags + Symbols** reduce cognitive load (users recognize their home currency quickly).
- **Real-Time Update** ensures no manual refresh is required.
- **List Management** (Add/Remove/Clear) makes the app customizable—users tracking fewer currencies (e.g., only USD & INR) won't be overwhelmed.

IV. CONCLUSION

The Currency Master application stands out as a powerful, user-centric tool designed to meet the growing need for real-time and accurate currency conversions in a globally connected world. By integrating reliable APIs, a clean and responsive user interface, and essential features like historical data tracking, the system provides a seamless experience for both everyday users and financial professionals. The project not only simplifies currency conversion but also encourages better financial decision-making by offering timely and accessible information. Its scalable architecture ensures room for future enhancements, such as multi-language support, offline mode, and crypto currency integration.

In conclusion, Currency Master is a robust solution that combines efficiency, usability, and modern design—making it an essential tool for anyone dealing with international currencies.

V. FUTURE WORK

In the future, the application can be enhanced with several advanced features to broaden its scope and usability. Multi-language user experience (UX) will enable global reach by supporting users across different regions and linguistic backgrounds. An explicit offline mode with pinned snapshots and user alerts can ensure accessibility even in the absence of an internet connection. Furthermore, incorporating cryptocurrency pairs alongside fiat currencies will diversify the platform to meet the growing interest in digital assets. Event overlays, such as central bank calendars, can be integrated into charts to provide users with contextual insights into market movements. Finally, on-device machine learning models may be employed to deliver short-horizon volatility alerts, offering proactive decision support while maintaining user privacy through localized processing.

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