GREY
HAT

Abstract

Grey Hat is an application for crypto users. It is essentially a full-featured crypto wallet with support for thousands of different coins and tokens. What makes Grey Hat unique is that it allows users to buy and sell crypto assets from within the app. This is accomplished in a novel way, as Grey Hat is able to connect to multiple centralized and decentralized exchanges. Users simply find the asset they want to purchase and create a buy order by indicating the amount of the asset to purchase. Grey Hat finds the best possible price and completely automates the buying process, transferring the newly purchased assets into the user's wallet. This automation removes the complexity and security risks inherent in manually purchasing and transferring crypto assets.

In addition to allowing the purchase, sale, and storage of crypto assets, Grey Hat also has many features useful to crypto traders. These features include live chart data, crypto news stories and technical data. Users can subscribe to the Pro version of Grey Hat to gain access to trading tips, free transfers, and well as tax reports.

The Basic version of Grey Hat is free to all users. Users are required to complete a KYC application in order to trade. A small fee is collected on transactions, which is reduced for subscribers.

Key Features

- Supports over 10,000 crypto assets
- Fiat & Crypto on ramp
- Connects to assets on multiple CEX and DEX platforms
- Buy and Sell directly in app
- Purchased assets moved to app automatically
- Automatic Price and Fee comparison for best trade

Grey Hat's token, HAT, can be held by users for additional benefits within the wallet. If users choose to pay their trading fees with HAT tokens, they receive a discounted rate.

The Problem

Trading cryptocurrency today is complex. There are hundreds of different exchanges, both centralized and decentralized, each requiring account creation and each operating differently. In order to purchase a specific asset, a user must find an exchange that has the desired asset and create an account. Then the user must learn to use that exchange platform, add funds, and purchase the asset. Finally, the user must find a wallet capable of storing that particular asset and figure out how to transfer the asset from the exchange to that wallet for secure storage.

Decentralized exchanges are even more intimidating for uninitiated users. They require the use of a web3 wallet, which can be complicated to learn to use. Web3 wallets must be funded with crypto assets such as ETH or BNB, and then connected to a decentralized exchange where those assets can be swapped for other assets. This process can be particularly daunting for users, and many users choose not to even invest in assets requiring these steps.

Most wallets support only a handful of the total assets available today. This results in users needing to maintain multiple software wallets and interact with many different exchanges to traverse the crypto landscape. And while there are some apps that are pretty user friendly, they are generally the most restrictive when it comes to currencies supported.

Centralized Process

- Find an exchange which has the asset of interest
- Sign up on that exchange
- Complete KYC
- Add funds
- Create a trade order
- Find a compatible wallet
- Download and install wallet
- Transfer asset to wallet

Decentralized Process

- Identify decentralized exchange which has asset of interest
- Download and install a web3 wallet
- Sign up on a centralized exchange
- Complete KYC
- Add funds
- Purchase asset to use for swaps on decentralized exchange (i.e. Ethereum)
- Transfer asset to web3 wallet
- Connect web3 wallet to decentralized exchange
- Create a swap order for desired asset
- Complete swap
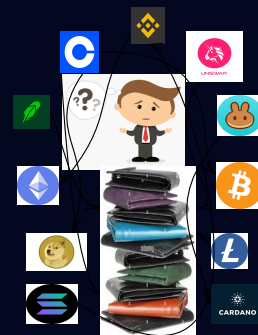
The Solution

Grey Hat simplifies both processes for purchasing crypto assets. In fact, the user experience when purchasing an asset found on either type of exchange (centralized or decentralized) is identical. The user only need complete KYC once with Grey Hat, and they never need to create accounts on other exchanges or learn to use them.

Grey Hat Trading Process

• Find asset of interest
• Create a buy order (specify amount to purchase)
• Complete buy

Grey Hat does everything else for the user. Grey Hat is capable of connecting to multiple centralized and decentralized exchanges. If the user wants to purchase an asset found on a centralized exchange, the app checks exchanges for the lowest price (including fees). It then purchases the asset and transfers it to the user's Grey Hat wallet. If the asset is found on a decentralized exchange, the app purchases the requisite swap asset (i.e. Ethereum) and transfers it to the wallet. Then the app connects to the decentralized exchange and completes the swap. Finally, the asset is transferred to the user's wallet. All of this happens automatically, so the user never needs to understand how to perform these steps. Selling assets is accomplished in the same manner, simply in reverse.

By simplifying these processes, Grey Hat strives to make crypto more accessible to average users. Additionally, the risk of loss from a user error during a buy or transfer is eliminated because the app handles everything.

Grey Hat keeps user safe and secure from on ramp to exchange transfers

A Different Way to Trade

So Grey Hat is simple, safe, and secure. It holds lots of different cryptos. That sounds great, but what sets it apart. There are, after all, many wallets currently available with some of the same capabilities. And although Grey Hat is arguably one of the most comprehensive wallets ever created, there is more to it than that.

While most wallets are built to store crypto, there are some current offerings that boast crypto on ramps, allowing the user to add crypto to the wallet from within the wallet itself. Where Grey Hat stands out is in just how it accomplishes this. By connecting to multiple

centralized and decentralized exchanges behind the scenes, several advantages are realized.

- Access to a much wider variety of assets
- Access to both centralized and decentralized exchanges from one interface
- Automatic price and fee comparison, resulting in getting the best deal without the need to shop around
- Use of web3 smart router contracts to ensure slippage is minimized on DEX trades

In addition to innovating trade value, Grey Hat also has a unique order/transfer routing system. This means complex processes including multiple trades and transfers happen seamlessly, informing the user as each step happens in real time. Once a user has approved a complex buy, such as using their USD to obtain a token found on one of the many DEXs, they can rest assured Grey Hat will do the rest. And as each step completes, the app let's them know through alerts and notifications. Once everything is complete, there is a full order history of the transactions involved.
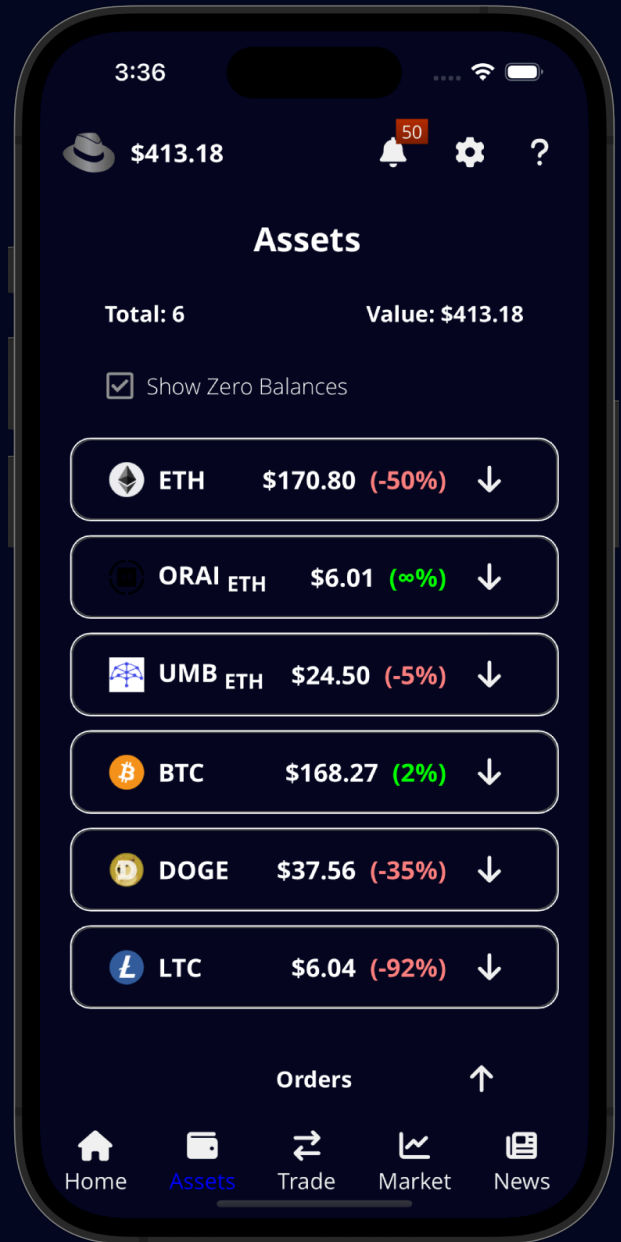
Technical Details

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This section describes how some of the processes are accomplished in Grey Hat. Some detail may be excluded where it is considered proprietary I.P.

Addresses

Addresses for different crypto assets are created by the app automatically. Several different commercial APIs are used for this purpose, allowing for handling address creation for a wide variety of assets. Public and private keys are automatically stored for future use in transfers. Private keys are stored using a proprietary encryption and storage mechanism developed specifically for Grey Hat. The exact details of this process will not be included here for security reasons. BTC and ETH addresses are generated for all users

(over 10,000). Binance Chain token support will be added in the first major release. Additionally, new coin support will be continually added to provide the most extensive asset support possible.

upon account creation. Addresses for other chains are generated on demand, when a user trades for that asset. A general description of the process follows.

It is important to note that private keys are encrypted and stored separately from address information (not in the database). The secure storage for encrypted keys is strictly controlled with white listed IPs and private certs.

The first production release includes support for over 70 of the most popular coins, as well as all Ethereum tokens

Buys

One of the biggest advantages Grey Hat provides is a very simple process to buy crypto assets. While the user experience is extremely simple and straightforward, the underlying process is quite complex.

The user has only to look up the asset of interest in a searchable list, select Buy, specify the amount to buy, and confirm the purchase. Behind the scenes, Grey Hat does quite a bit more.

First, Grey Hat pulls market data in real time from CoinmarketCap. So as the user is searching for an asset they wish to purchase, the app is providing them real time price information. When the users select an asset to buy, the app creates a Buy Order interface. Once the user enters the desired amount to purchase, the app queries all available exchanges where the asset is listed.

At

this point, Grey Hat is receiving actual market trade pricing including fees from the different exchanges. The app selects the most cost effective option automatically, then presents the user with an estimate of the purchase details (amount of asset to be purchase, fees, total cost).

If the user confirms the purchase, Grey Hat then uses the selected exchange's API to create a buy order. Once that order is complete, the app uses the exchange API to transfer the purchased asset to the user's Grey Hat wallet.

If the asset is found on a decentralized exchange, the process is similar with a few extra steps. As in the first explanation, live market data is used to calculate the current market price for the asset. The difference is that the app has to factor in the purchase and transfer of a swap asset (i.e. Ethereum) to get the final asset. When the user confirms the purchase, Grey Hat purchases the swap
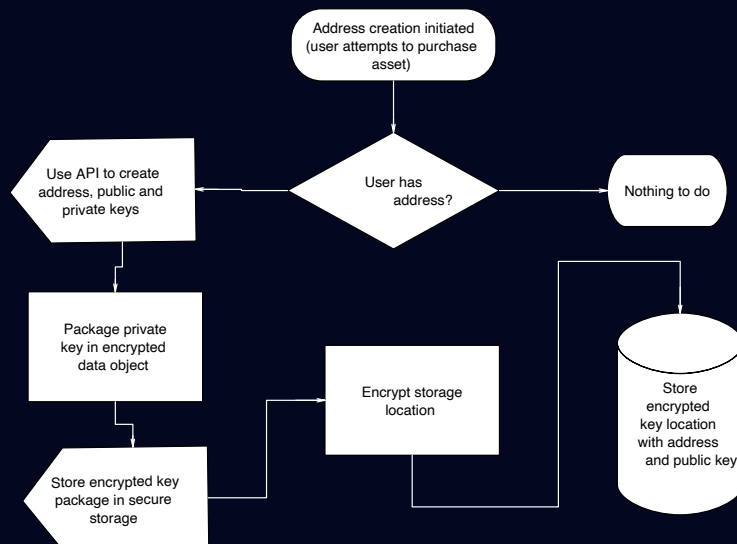
General address creation workflow

asset, transfers it into the wallet, then uses the decentralized exchange API to complete the swap and move the asset into the user's wallet.

Key Features

- Buy from multiple CEX and DEX

- Trade and transfer fees estimated before buy execution

- Complete DEX buys using USD (Grey Hat handles swap asset purchase)

- Assets transferred to wallet automatically

- Automatic Price and Fee comparison for best trade

User searches for crypto to trade

App shows available crypto and price

Database stores market data

Market data retrieved from CMC every 10 minutes

User creates buy order defining amount to purchase

CEX

Find CEX with best price and lowest fees for asset

App creates a buy order with fee info

CEX or DEX asset

Find CEX with best price and lowest fees for swap asset (i.e. ETH)

Find DEX with best price and lowest fees for target asset

DEX

User approves buy order

CEX

CEX or DEX asset

1) App purchases target asset

2) Asset is transferred to wallet

1) App purchases swap asset (ETH)

2) Swap asset is transferred to wallet

3) Swap for target asset is created

4) Swap is executed

5) Target asset is moved to wallet

DEX

Grey Hat Trading Process

Sells

Sells are basically buys in reverse. When a user wants to sell an asset, they simply select the asset from their wallet and click Sell. The user is then presented with a sell order interface, where they enter the amount to sell. Grey Hat then checks with exchanges that support the asset and gets the current market price and any fees required to sell the asset. If there are multiple exchange options, the app chooses the best option for the user. If the user completes the sell order, Grey Hat uses the selected exchange API to sell the asset. Finally, the funds received are transferred to the user's Grey Hat wallet.
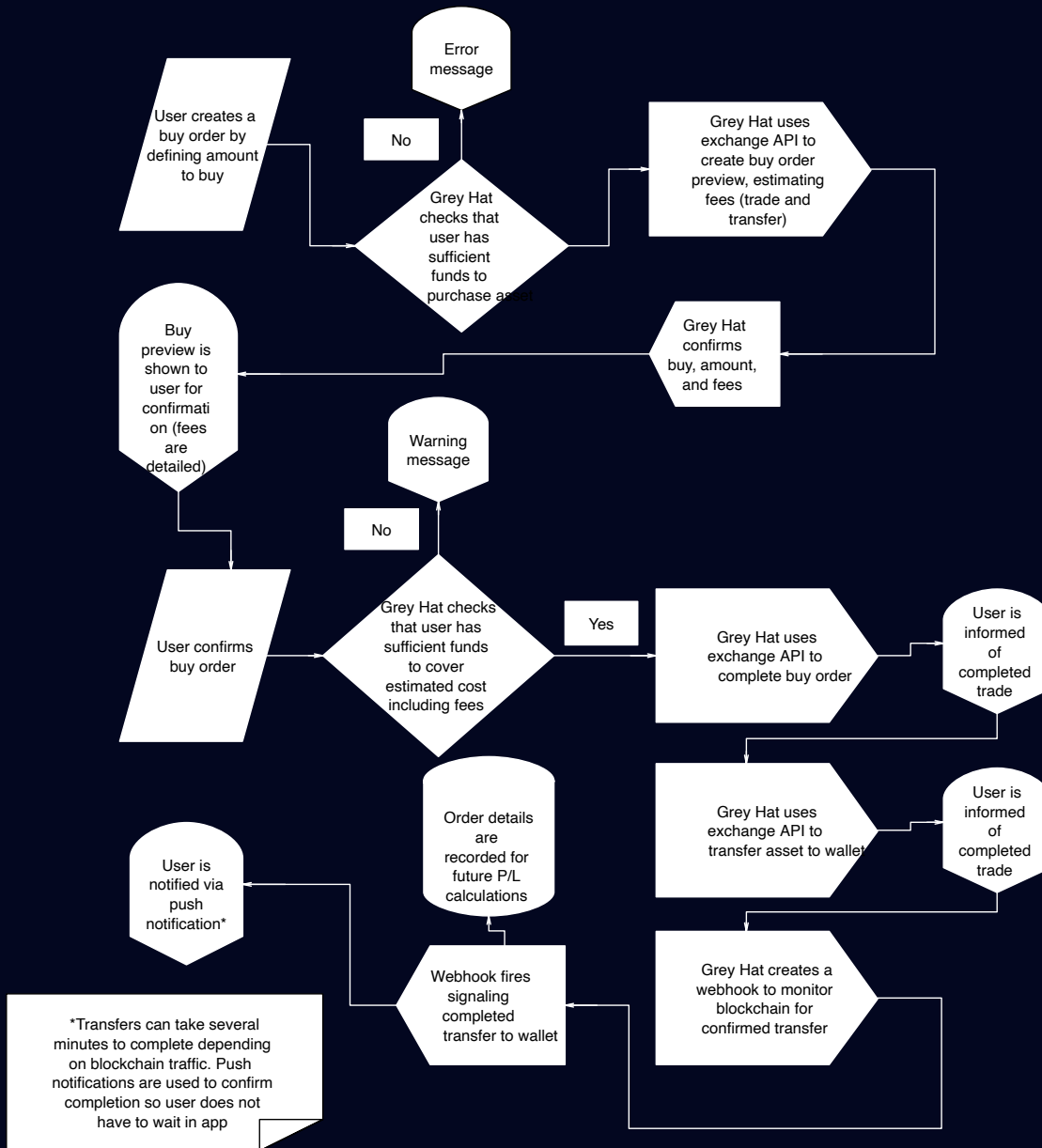
If the asset is listed on a decentralized exchange, the same extra steps involved in a buy occur in reverse order. The asset is swapped back into a standard swap asset (again, usually Ethereum). The received Ethereum is then sold for the best possible price on a centralized exchange for fiat (USD), which is finally transferred back into the user's wallet.

Transfers

Asset transfers during buy and sell operations are handled by the app automatically. This is accomplished using the different exchange APIs in conjunction with various commercial APIs capable of interacting with the blockchain for that particular asset. These transfers happen in the background as part of the buy or sell process, so the user need not understand how they work. Because the app stores private keys for the user's addresses, it can accomplish this programmatically.

Grey Hat's ability to complete trades and subsequently transfer the asset to the user's wallet is a key feature. This allows for the user to see the total cost of purchasing an asset, including trade and transfer fees, prior to deciding to complete a trade order. This is especially important for DEX assets which can incur total fees in excess of $100 during peak gas price times. It also serves to keep users safe. Even experienced traders can make a mistake when manually transferring assets between exchanges and personal wallets. Grey Hat eliminates the need for this manual step while simultaneously providing the user more detailed, real time feedback during each stage of the order.

A detailed diagram of the trade process with transfers follows.

Error
message

User creates a
buy order by
defining amount
to buy

No

Grey Hat uses
exchange API to
create buy order
preview, estimating
fees (trade and
transfer)

Grey Hat
checks that
user has
sufficient
funds to
purchase asset

Buy
preview is
shown to
user for
confirmati
on (fees
are
detailed)

Grey Hat
confirms
buy, amount,
and fees

Warning
message

No

User confirms
buy order

Grey Hat checks
that user has
sufficient funds
to cover
estimated cost
including fees

Yes

Grey Hat uses
exchange API to
complete buy order

User is
informed
of
completed
trade

Order details
are
recorded for
future P/L
calculations

Grey Hat uses
exchange API to
transfer asset to wallet

User is
informed
of
completed
trade

User is
notified via
push
notification*

Webhook fires
signaling
completed
transfer to wallet

Grey Hat creates a
webhook to monitor
blockchain for
confirmed transfer

*Transfers can take several
minutes to complete depending
on blockchain traffic. Push
notifications are used to confirm
completion so user does not
have to wait in app

This diagram details the buy order process including transfers and user feedback

If the user desires to transfer an asset manually, they can do so using a simple interface in the app. To send an asset, the user just needs to know the address of the destination. The app creates the transfer for them. To receive crypto, the user just needs to copy the Grey Hat address for the asset and use that with the platform they are sending it from. This is similar to other applications.

Market Research

Users can use Grey Hat to do simple research on assets of interest as well. The Market section of the app is a searchable list of thousands of crypto assets. Key technical information is provided, such as price, volume, supply, and market cap. The user can also open a price chart. If the user wants to keep track of a certain asset, it can be added to their watch list. The app will send alerts to the user whenever a watched asset has a significant price change.

Current crypto news stories are also available in the app.

On/Off Ramp

Grey Hat uses Stripe on and off ramps to make it easy for users to fund their wallet. This gives the user options to use bank accounts, credit cards, and other popular forms of payment to add USD to their wallet. Additionally, the user can use Stripe to buy top crypto assets directly, basically funding their wallet with an asset instead of fiat (BTC, ETH, and others).

When a user wants to take USD out of their wallet, the Stripe Off ramp makes this a simple process. Grey Hat also has an On/Off ramp compatible with foreign countries and currencies.

Grey Hat also has an agreement with RAMP, which has a very robust international on/off ramp. RAMP will be integrated in The first Production update.

KYC

KYC, also known as know your customer is a process required of any application which allows users to manage or trade crypto. Although Grey Hat is not an exchange, it does offer access to asset trades through other exchanges. Therefore, it is required that Grey Hat process all users through a KYC process. This process is handled in the app through Stripe KYC, which ensures compliance. Once a user completes KYC and is approved, they never have to do it again.

Interface

The interface is an important aspect of an application like Grey Hat, as it is core to the user experience. The following screen shots are captioned to explain key parts of the interface. These have been updated since the initial version of this paper, as more of the product has been developed.

The Grey Hat app is designed as a Progressive Web App (PWA). This allows for the app to be installed on any device that has a web browser, and allows for updates to be pushed out quickly to all users. This also allows users to run the app without installing it, just by opening a web browser and going to the app url.

Notifications

Users can select to get notifications through email, text, and push. Critical notifications (trades and transfers) are delivered as push notifications so the user is sure to receive them even if the app is closed.
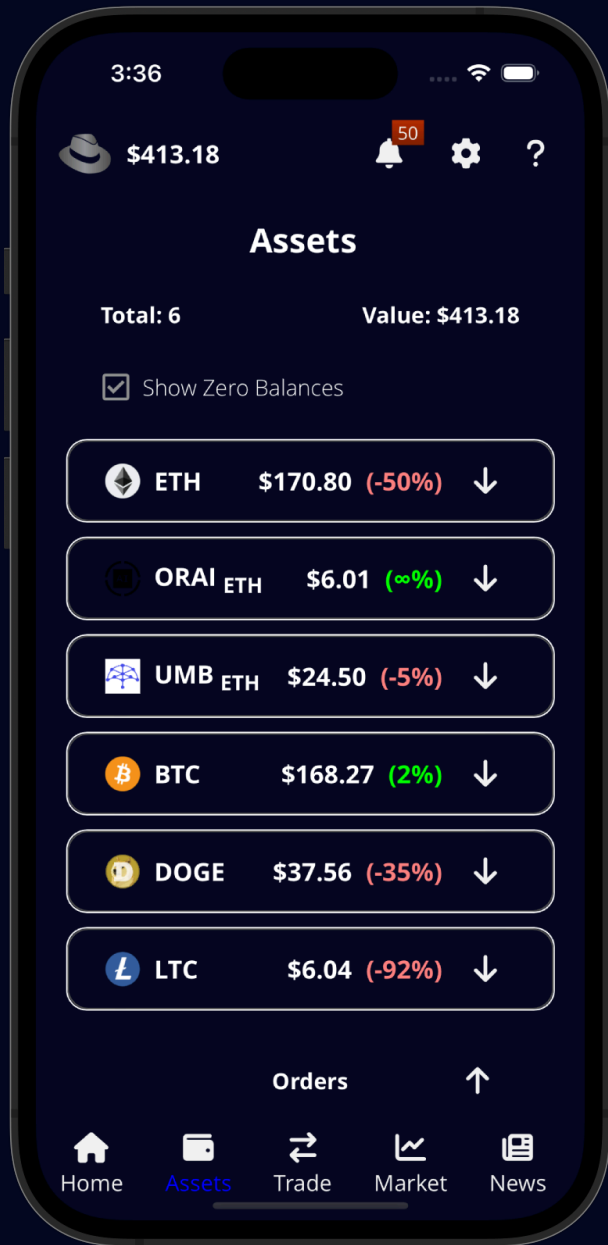
Security

Grey Hat offers Multi Factor Authentication to ensure security of the user's wallet.
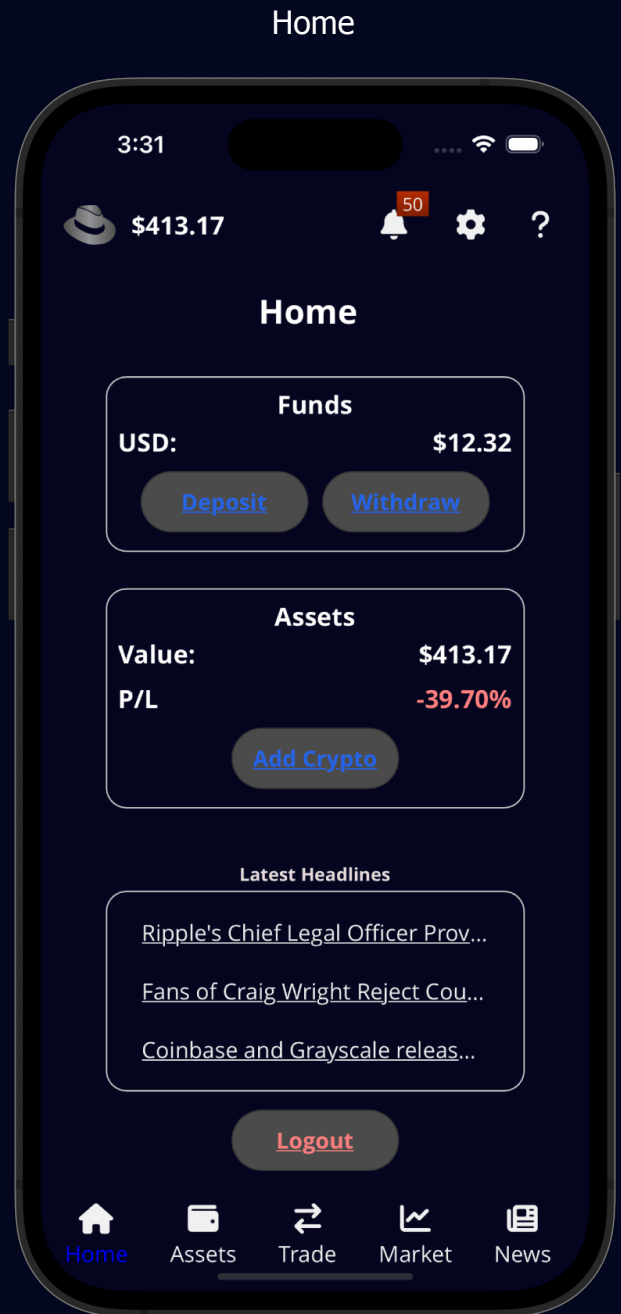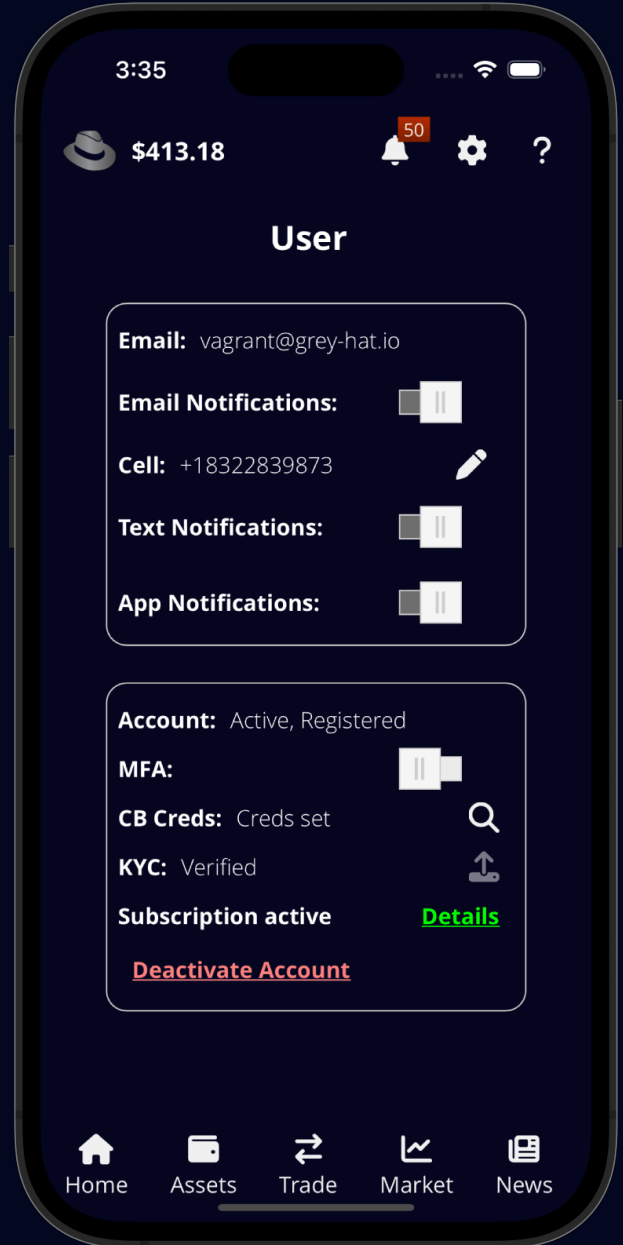

The home screen shows available funds, asset summaries, and top news stories

Wallet

User

The Asset screen shows assets currently stored in the wallet, as well as current and previous orders

The User screen contains the user settings

Market

Chart

Market

🔍 [   ] ▽

₿ Bitcoin (BTC)

Price	$62,878.00 (-1%)
Volume	4.28e+10 (-7%)
Supply	1.97e+7
Market Cap	1.24e+12
ATH (3/14/2024)	$73,750.07 (-17%)
ATL (7/14/2010)	$0.048647 (1.29e+8%)
Chain	N/A

◆ Ethereum (ETH)

Price	$3,062.10 (-1%)
Volume	2.00e+10 (-13%)
Supply	1.20e+8
Market Cap	3.68e+11
ATH (11/16/2021)	$4,891.70 (-60%)
ATL (10/21/2015)	$0.420897 (7.27e+5%)

← Page [1] of [496] →

Home Assets Trade **Market** News

Chart

BTC

Home Assets Trade **Market** News

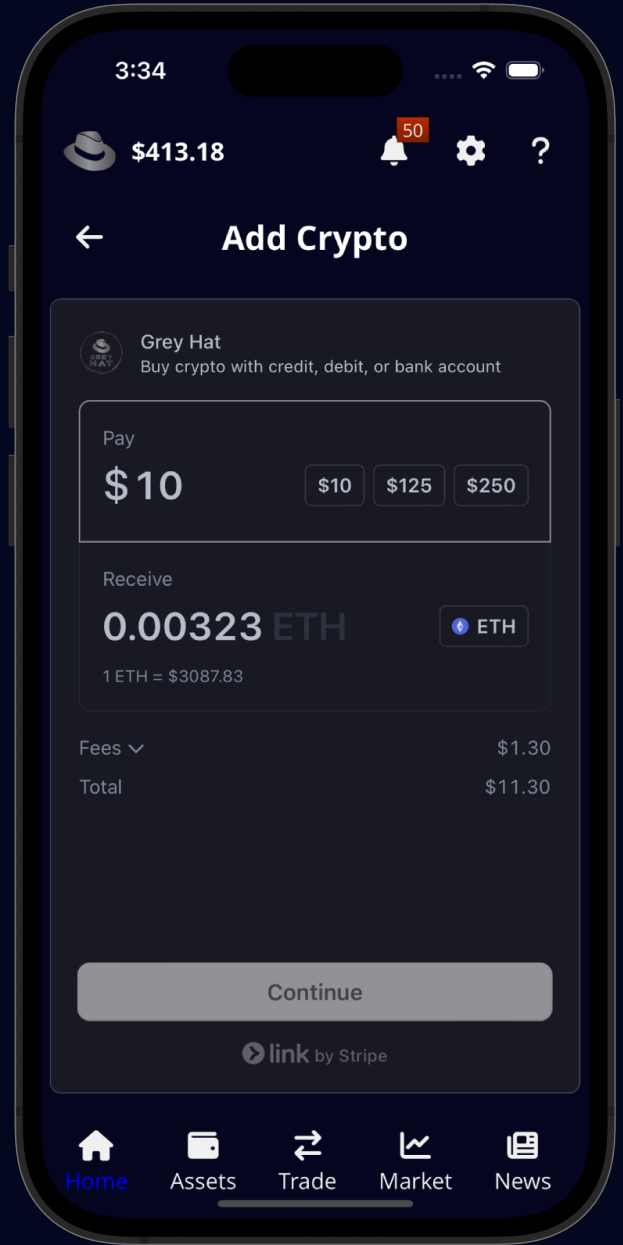Users can search current market price and technicals

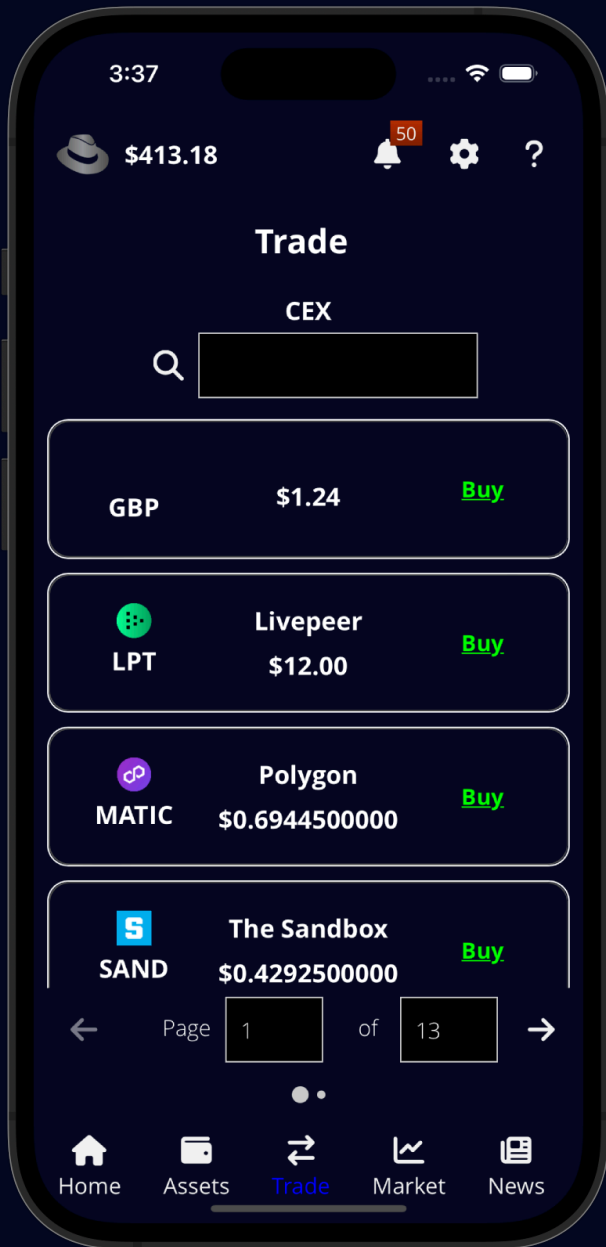Users can see real time chart data for assets

Deposit Funds
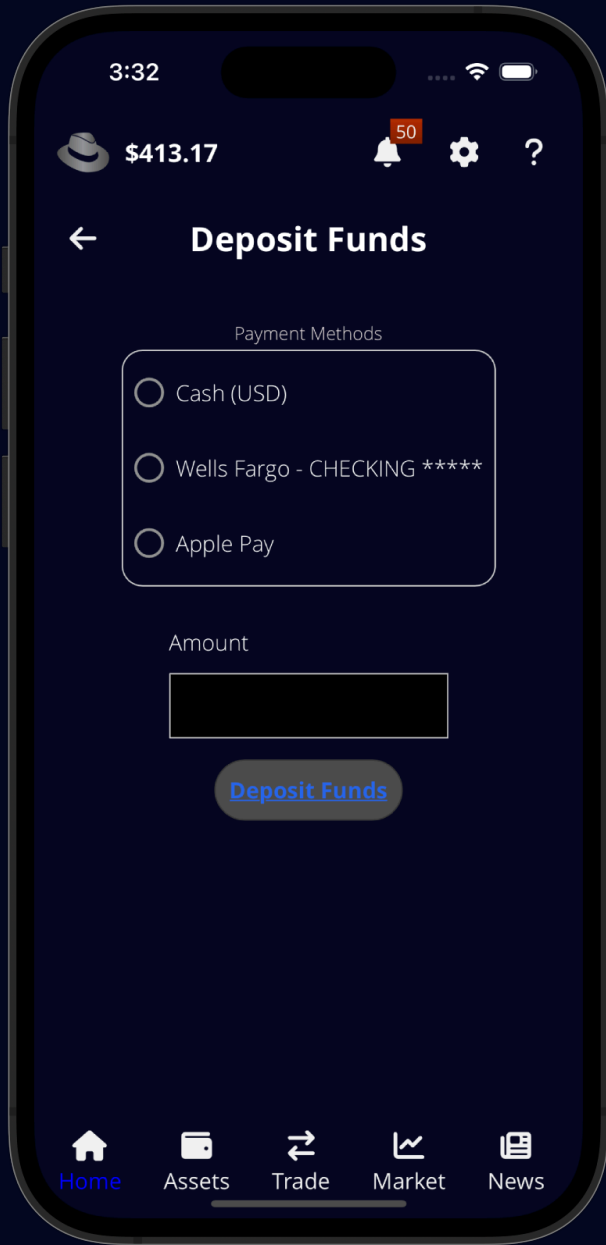
Add Crypto

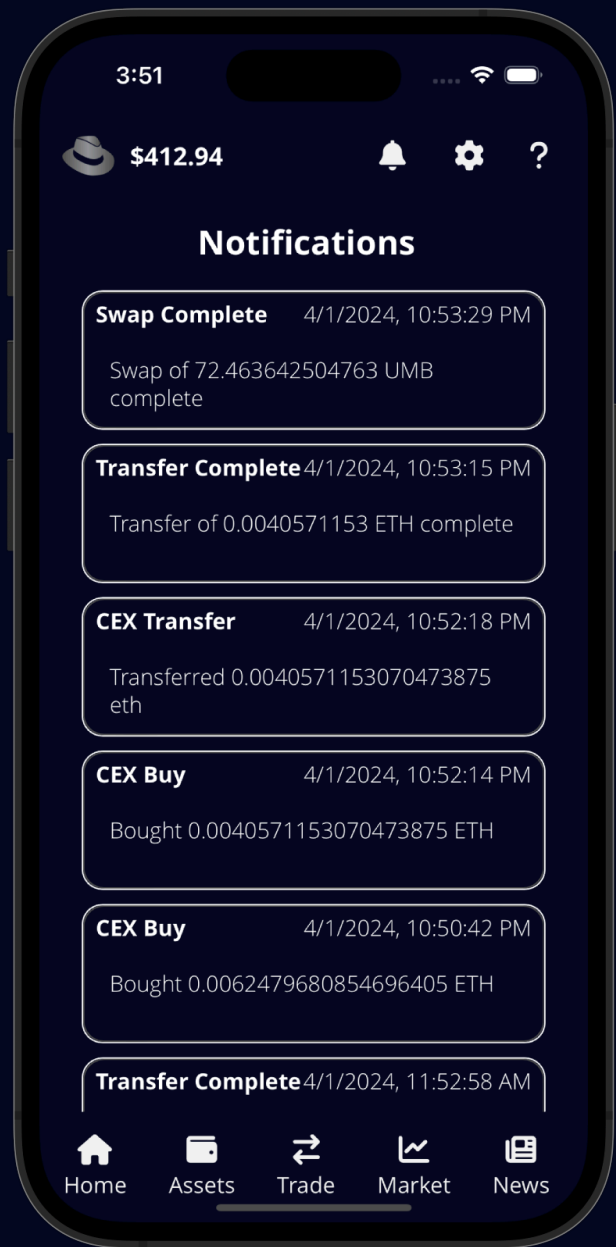**Deposit USD into wallet for buying crypto**

Add crypto directly to wallet using credit card or bank account

CEX Trade

Find asset which can be traded

DEX Trade

Notifications about different events such as buys, sells, and transfers

Buy

UMB

$0.0301833931

☑ Use ETH from wallet

USD Amount

10 ⊗

Funds Available: $188.55

Crypto Amount

331.308012862113 ⊗

Estimated Fees

20

Total

30

Create a buy order which can be previewed before executing

Order Details

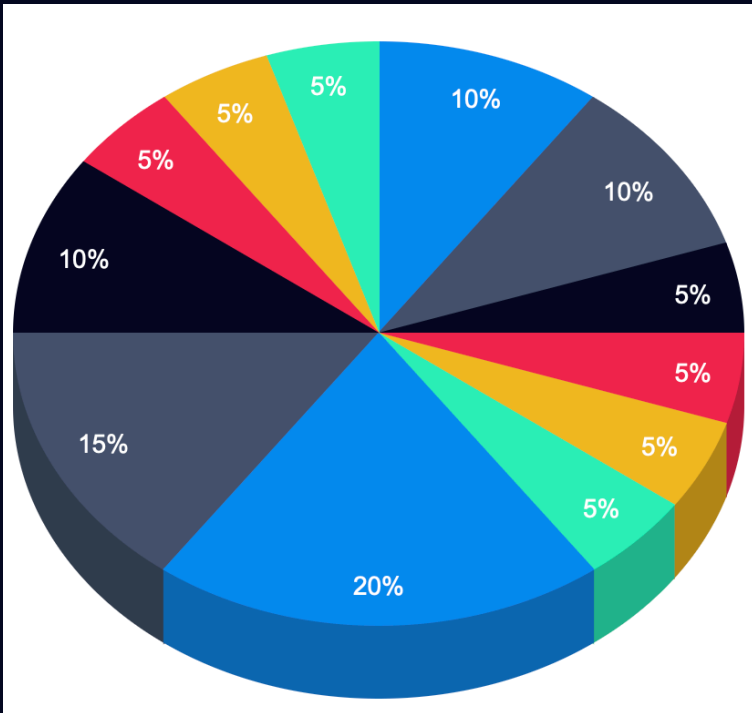|	
UMB Amount	331.308012862
Price	0.0301833931
Subtotal	10
Fees	20.304936420
Total	30.304936420

Place Swap   **Cancel**

Preview Swap

Verify details of swap before executing

Token

Token Name: HAT
Token Ticker: HAT
Token Role: Utility
Token Type: Ethereum, ERC20
Price at ICO: 0.10 USD
Total Supply: 1,000,000,000 (1B)

Table 1

Legend:
- ICO private sale
- Release on IEO
- Exchange listing phase 1
- Exchange listing phase 2
- Allocated for philanthropic cause
- Escrow- unaccounted distribution
- Team and Advisors
- Reserve Fund
- Community and Marketing
- Partnerships and Ecosystem Development
- Rewards
- Airdrops

Token Distribution	% of Token
ICO Phase	40%
ICO Private Sale	10%
Release on IEO	10%
Exchange listing phase 1	5%
Exchange listing phase 2	5%
Philanthropic allocation	5%
Escrow	5%
Team and Advisors	20%
Reserve Fund	15%
Community and Marketing	10%
Partnership Development	5%
Rewards	5%
Airdrops	5%

Roadmap

Q1 2024 - Dev Release
• Login/Registration
• Wallet Address Creation
• Key Storage
• CEX Lookup/Quotes
• KYC
• DEX Listing
• Technical Analysis

Q4 2024 - Alpha Release
• US On Ramp
• Charts
• News
• Texts/In App Alerts

Q1 2025 - Beta Release
• Multiple CEX
• Hot Tips
• Tax Reports
• HAT Token

Q3 2025 - Production 1
• Additional CEX Integrations
• Advanced DEX Tools
• European On Ramps
• Web3 Wallet Capabilities

Q1 2026 - Production 2
• NFT Market/Purchase
• Advanced Trade Features
• Fundamental Analysis
• Browser Extension

Q3 2026 - Production 3
• Social Media Integration
• Intra-App Transfers (Free)

Q1 2027 - Production 4
• Additional Pro Features (TBD)
• Private Asset Sales (Marketplace)

Q3 2027 - Production 5
• Advanced Market Features
• Select Web3 Integrations