

# Lucky Day

## Blockchain Buy/Sell App

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### Project Overview

This project utilizes a Streamlit app to handle private and public blockchain sales transactions. Included in this project is a prototype for the future in vehicle history records using smart contracts (see executive summary for **LuckyDay Vehicle History Report**).

As of 2021, the global used car market estimated worth was 1.57 Trillion USD, with an expected growth rate of (CAGR) 6.1% from 2022 to 2030.<sup>1</sup> It is a historically consistent market with used vehicle sales averaging 15.18 million per year between 1993 and 2022<sup>2</sup>. Sales transactions are often done with slow outdated technology and create a confusing sales process for consumers. Web 3 technology is beginning to disrupt this industry. Our app was conceived from the challenges of privately selling a vehicle and our growing knowledge of blockchain and smart contracts. Armed with the knowledge that in 2022, just over 1.4 million used cars sold privately<sup>3</sup>, we knew there was a market for our app and had some ideas on how to approach it.

### Target Goal

The primary goal of this project is to create a simple, user-friendly interface for users to buy and sell assets on the blockchain using industry standards. Upon further research, we saw how using Solidity smart contracts would allow another level of vehicle ownership and sales by creating tokens based on the VIN and saving all manner of vehicle records to the token. This concept has dynamic, far reaching possibilities for the future of vehicle ownership and sales.

### Concept Development

"Lucky Day" is a simple Streamlit dashboard GUI which prompts the user to choose a transaction type from a sidebar menu in order to open the correct page for their data entry and Ethereum blockchain transaction.

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<sup>1</sup> Report ID: GVR-4-68039-119-7, <https://www.grandviewresearch.com/industry-analysis/used-car-market>

<sup>2</sup> "Don't Miss Out on These 20 US Car Sales Statistics for 2022, 1/18/2022, (Trading Economics), <https://carsurance.net/insights/car-sales-statistics/>

<sup>3</sup> U.S: Used Vehicles Monthly Sales 2022, 9/2/2022, Mathilde Carlier, <https://www.statista.com/statistics/1325052/us-used-vehicles-sold-monthly-by-private-parties/#:-:text=just%20over%201.4%20million%20used,United%20States%20in%20July%202022.>

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### \*\*\*Vehicle\_Motorcycle\_Sales\*\*\*

Private transactions of vehicle/motorcycle sales is handled by following data prompts on the main page. Choose between a simple, inexpensive, one-time monetary transaction to be recorded on the blockchain ("Simple Blockchain Transaction"), or spend more in gas to also have a Solidity smart contract associate a blockchain token to the user's vehicle/motorcycle VIN ("Smart Contract Enabled"). The smart contract creates a VIN-token and allows for all sale transaction details to be recorded to the blockchain.

### \*\*\*NFT\_Auction\*\*\*

A second functionality of the buy/sell app connects buyers and sellers to enable auction bidding on NFT assets over the Polygon Network. A smart contract, using ERC721 standards, acts to tokenize and hold the NFT asset and handle the sale/auction transaction on a secure public blockchain network. Cloud based file storage technology (IPFS- Pinata) is utilized to store the information/images of the digital or physical asset being sold. The use of Polygon Network provides the user with a method that is lower cost and more efficient (faster), than transacting directly over the Ethereum Network.

*Note: Polygon is essentially a "scaling solution" that aims to address the inefficiencies of transacting with the high demand ethereum network - it groups multiple transactions into a single block before committing them to the main ethereum network.*

### \*\*\*Vehicle\_Records\*\*\*

A third functionality currently displayed within the Lucky Day dashboard is an interface for Solidity smart contract enabled vehicle records. The interface allows you to control tokenization of your vehicle VIN and its history record. This record may include maintenance, upgrades, warranties, accidents, previous ownership, type of use or title changes. Selling a tokenized vehicle or motorcycle could demand a higher sale price in the future as all records are accessible in one place. For more details on this functionality and design details see the executive summary for LuckyDay Vehicle History Report.

## Blockchain & Wallets

The python code in this project leverages the program Ganache to connect the user's crypto wallet to the Streamlit interface. In a deployed application the user would have to be given the seller's wallet address to fill in the streamlit app and complete the transaction. In its current beta form, the "Seller's Wallet Address" is prefilled with dropdown options connected to a Ganache test network.

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## Market Application

Currently, there are only a few blockchain apps focused on vehicles, with the most notable, Carnomoly, <https://carnomaly.io/>, which has developed an entire platform of services, primarily targeting used car dealerships.

There is greater competition for the NFT auction functionality of Lucky Day, with OpenSea <https://opensea.io/>, being the most well-known. Again this company offers an entire platform of services, and requires a one-time registration fee to list each NFT in addition to recurring fees to maintain its functionality and profits.

“Lucky Day” is focused on simple services directed to the private user market. It will have low development cost, and far less maintenance expenses compared to platforms like Carnomoly and OpenSea.

## Dashboard Design Details

- Sales Vehicles/Motorcycles
  1. The sidebar menu is connected to the user’s first Ganache wallet address and shows their current ether balance.
  2. The user is prompted to enter basic information about their transaction type before being shown a secondary expandable form with input areas to enter the transaction details:
    - Make, model, year, VIN, color, title type
    - Seller’s Name and wallet address, Buyer’s name (their wallet address and balance is written in the sidebar)
  3. The user is asked to review a summary of the information entered before the transaction is completed.
  4. If the user chose to have a “Smart Contract Enabled” transaction, the information they entered will be incorporated into a Smart Contract which creates a token associated with their VIN.
  5. The app prints the completed transaction information and hash, it also updates the buyer’s wallet balance on the sidebar, or warns the user if they do not have enough ether in their wallet to complete the transaction.
- NFT Auction
  1. The sidebar menu is connected to all the addresses in the user’s Ganache and their current ether balance is displayed upon selection
  2. The user can view all the NFT options in the Auction with details on:
    - NFT name, account address, artist and minimum bid price

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3. In the sidebar, the user can choose an auction item and make a bid, the smart contract is activated and the bid is held until the end of the auction period. The user also has the option to withdraw a bid.
  4. At the end of the auction period, a safe and secure blockchain transaction is completed for the highest bidder, with the asset token being reassigned to their address. All other bids are returned to the congruent acct
  5. Additional auction function features include:
    - Ability to participate in open auction where bid prices keep increasing over the duration of the auction, making the asset more valuable than its initial offering
    - Ability to monitor the auction process( start bid, bid price, highest bidder etc.)
    - Ability to view the frequency of each bidder
- Vehicle Records
    1. See the executive summary for **LuckyDay Vehicle History Report**.

## Future Development

- *MINOR*
  - Connect to web based platform APIs to access additional in-app information for the buyer (all currently behind paywall):
    1. Connect database with auto-complete of all car makes and models
    2. Connection to Kelly Blue Book API for estimate of car's value
    3. Connect to Carfax or carVertical for vehicle history
  - Code: error control messages, request donation/ apply small fee
- *MAJOR*
  - Compilation of apps functionality into one page: would require significant merging/changing of code
  - Deployment: would require more research in to how to manage secrets, smart contracts and wallet accounts

## Summary

Web 3 technology is changing the auto industry at a fast pace. Lucky Day is a prototype app, leveraging web 3 technology that supports a new way to think about car ownership and sales. We feel it has excellent market potential in an industry that shows no signs of slowing down.

## Team Members

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