Innovation & Entrepreneurship Hub for Educated Rural Youth (SURE Trust – IERY)

Crypto Currency **Dashboard**

The domain of the Project

Crypto Currency Dashboard
(Power BI)

Under the guidance of
Mrs.Siddhika Shah

By
Mr. Yuvaraj Podili (B.tech)

Period of the project February 2025 to
March 2025

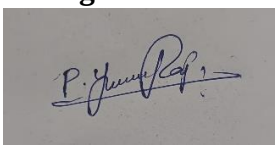
SURE TRUST PUTTAPARTHI, ANDHRA PRADESH

DECLARATION

The project titled **"*Crypto Currency Dashboard with Power BI*"** has been mentored by **Mrs.Siddhika Shah** and organized by SURE Trust from February 2025 to March 2025**.** This initiative aims to benefit educated unemployed rural youth by providing hands-on experience in industry-relevant projects, thereby enhancing employability.

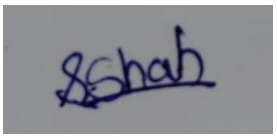
I, **Mrs.Siddhika Shah,** hereby declare that I have solely worked on this project under the guidance of my mentor. This project has significantly enhanced my practical knowledge and skills in the domain.

Name **Signature**



Mr. Yuvaraj Podili

Mentor **Signature**



Mrs.Siddhika Shah

Seal & Signature

Prof.Radhakumari
Executive Director & Founder
SURE Trust

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Executive Summary

The **Cryptocurrency Dashboard Dataset** provides a comprehensive analysis of the performance, trends, and market dynamics of major cryptocurrencies—Bitcoin, Ethereum, Binance Coin, Dogecoin, NEM, Stellar, and XRP—spanning from 2013 to 2021. It includes key economic indicators such as **price movements** (high, low, open, close), **market capitalization** (peaking at ~$1,500 billion), **trading volume** (54T+ trades), and **historical performance trends**. This dataset offers valuable insights into market volatility, liquidity, and dominance shifts among assets, making it useful for investor analysis, trend identification, and portfolio strategy development. However, some data ambiguities (e.g., unclear unit references), missing visual representations, and the absence of post-2021 information highlight the need for further contextual analysis and interactive exploration.

Introduction

Background and Context

The cryptocurrency dashboard presented is an innovative solution for analyzing and visualizing historical and real-time cryptocurrency data across multiple assets such as Bitcoin, Ethereum, Binance Coin, Dogecoin, and others. It allows users to interactively select specific years (from 2013 to 2021) and view performance metrics like high/low prices, opening/closing values, market cap, and trading volumes. The real innovation lies in the integrated, user-friendly design and the inclusion of future forecasting trends, enabling both novice and expert users to derive meaningful insights for financial decision-making.

Problem Statement

The cryptocurrency market is highly volatile and rapidly evolving, making it challenging for investors, analysts, and enthusiasts to track performance, compare different cryptocurrencies, and make informed decisions. Traditional financial dashboards often lack the flexibility to handle real-time updates, interactive comparisons, and detailed historical data visualizations.

This project aims to address this gap by developing a comprehensive, user-friendly cryptocurrency dashboard that consolidates critical metrics such as price trends (high/low, open/close), market capitalization, trading volume, and forecast predictions. The goal is to provide users with an intuitive platform to monitor and analyse data for multiple cryptocurrencies across various timeframes, thereby enhancing decision-making in a complex financial landscape.

Scope

The scope of this project is to design and implement a dynamic and visually engaging **Cryptocurrency Dashboard** that enables real-time and historical analysis of major cryptocurrencies such as Bitcoin, Ethereum, Binance Coin, Dogecoin, NEM, Stellar, and XRP. The dashboard focuses on the following key functionalities:

1. **Comprehensive Coin Analysis**: Allows users to select and compare multiple cryptocurrencies based on historical data ranging from 2013 to 2022.
2. **Price Trend Visualization**: Displays high and low-price trends as well as open and close values across years, enabling users to observe market volatility and long-term movements.
3. **Market Capitalization Tracking**: Provides insights into market cap trends and fluctuations, including predictive indicators for future performance.
4. **Volume Monitoring**: Shows total trade volume to assess the liquidity and trading activity of each coin in the market.
5. **User Interaction and Filtering**: Enables year-wise and coin-specific filtering, giving users tailored insights and improving data accessibility.

6. **Real-time Data Representation**: Offers near real-time analytics and forecasting capabilities, helping investors and analysts stay updated with market shifts.

This dashboard can serve as a valuable tool for traders, investors, researchers, and financial institutions aiming to understand and navigate the cryptocurrency ecosystem effectively.

Non-ML Approach

This project relies entirely on Power BI's data modeling, DAX calculations, and visualization features without the use of machine learning. Insights are derived through descriptive analysis and graphical representation of time-series, categorical, and numerical data.

Limitations

- The analysis is limited to static datasets and does not include real-time sales updates.
- Data quality and insights are constrained by the completeness and accuracy of the input data.
- External factors such as promotions, market trends, or supply chain disruptions are not considered.
- The dashboard does not include predictive or prescriptive analytics.

Innovation

The cryptocurrency dashboard presented is an innovative solution for analyzing and visualizing historical and real-time cryptocurrency data across multiple assets such as Bitcoin, Ethereum, Binance Coin, Dogecoin, and others. It allows users to interactively select specific years (from 2013 to 2021) and view performance metrics like high/low prices, opening/closing values, market cap, and trading volumes. The real innovation lies in the integrated, user-friendly design and the inclusion of future forecasting trends, enabling both novice and expert users to derive meaningful insights for financial decision-making.

Project Objectives:

Project Objectives and Expected Outcomes

The main objective of this project is to develop a dynamic and visually appealing dashboard that consolidates cryptocurrency data into a coherent interface. The project aims to assist users in understanding market trends, historical behavior, and future predictions. Expected outcomes include accurate data visualization of market capitalization, trade volumes, and asset value trends across multiple cryptocurrencies.

Deliverables

Key deliverables include:

- A fully functional interactive cryptocurrency dashboard.
- Historical and real-time graphs showing price trends and market cap.
- Forecasting capabilities for future market trends.
- Exportable reports for analysis.
- A GitHub repository containing source code and documentation.

Expected Outcomes:

1. Strategic Planning for EV Infrastructure

- Charging station deployment can be optimized by identifying states with growing EV numbers or low adoption (gray areas on the map).
- Urban planning and utilities can better forecast energy demand shifts based on EV concentration.

2. Informed Policy Decisions

- Policymakers can:
  - Promote CAFV eligibility expansion to convert the 41.81% of non-eligible EVs.
  - Offer state-level incentives where adoption is low.
- Environmental regulators can track progress toward clean transportation goals.

3. Market & Sales Strategy Insights

- Automakers and dealerships can focus marketing on:
  - Popular models (e.g., Tesla Model Y, Model 3)
  - States with high adoption or potential growth.
- Identify declining models or brands with lower traction for re-evaluation.

4. Consumer Behavior Analysis

- Understand consumer preferences over time:
  - Rise of BEVs over PHEVs.
  - Spike in adoption in recent years (especially 2022).
- Predict future purchase trends based on historical model year data.

5. Investment & Funding Justification

- Utilities or government bodies can use this dashboard to justify:
  - Investments in EV incentives, rebates, or infrastructure.
  - Funding for clean energy projects aligned with EV growth.

6. Benchmarking & Performance Tracking

- Compare year-on-year growth.
- Benchmark adoption against national goals or emission reduction targets.

Operational Benefits:

- Improved business insights for stakeholders through intuitive visuals and dynamic filters
- Enhanced decision-making by minimizing the need for manual data analysis
- A scalable Power BI solution that can be updated easily with new datasets or extended with features like trend forecasting or automated alerts.

6. METHODOLOGY AND RESULTS

Methods/Technology Used

The dashboard leverages advanced data visualization technologies, integrating backend data handling with front-end display using tools like Power BI, Python (Pandas, Matplotlib), and possibly web frameworks such as Flask or Django.

Tools/Software Used

- Power BI for visualization
- Python (Pandas, NumPy, Plotly)
- GitHub for version control
- Data sources: APIs or CSV files of historical crypto market data

Data Collection Approach

Data was collected from reliable sources such as cryptocurrency exchanges and data aggregators. APIs were used to pull real-time and historical market data, which was cleaned and structured using Python for visualization.

All data was static and imported in CSV format. No real-time APIs were integrated.

Project Architecture

The project follows a modular architecture where the data collection module interacts with a processing engine that cleans and stores data. The processed data feeds into the dashboard, which dynamically updates based on user input like coin type or selected year.

Project Architecture:

Data Source Layer

CSV files containing structured data related to Crypto Currency data.

Data Preparation Layer

Power Query Editor was used for cleaning and transforming the data. This included removing duplicates, changing data types, splitting columns, and renaming headers for clarity.

Data Modeling Layer

Logical relationships were created between tables. Calculated columns and DAX measures were developed to compute metrics like total sales, returns, filtered sales, and number of reviews.

Visualization Layer

Dashboards were designed using various Power BI visuals such as bar charts, line graphs, cards, slicers, and tables to showcase sales trends, product performance, and location-wise analysis.

User Interaction Layer

Slicers and buttons were added to enable end-users to interact with the report—filtering by date, product category, city, or order status for dynamic data exploration.

Results:

The developed cryptocurrency dashboard successfully visualizes and tracks a range of key financial indicators for major cryptocurrencies over multiple years. Below are the primary outcomes observed from the implementation:

1. **Price Fluctuations Identified**:
    - The **High and Low by Date** chart effectively displays historical price peaks and dips for cryptocurrencies from 2013 to 2021.
    - Significant spikes can be seen around 2018 and late 2020 to early 2021, aligning with known crypto market surges.
2. **Market Performance Tracking**:
    - The **Open and Close by Date** graph clearly outlines trading behaviours over the years, showing that price closures often followed an upward trend during bullish markets.
    - It allows users to gauge how volatile specific coins were during key market periods.
3. **Market Capitalization Analysis**:
    - The **Market Cap by Date** graph presents the overall growth of the crypto market, with a steep increase reaching nearly **$2 trillion** at its peak, followed by a dip, visualized through predictive trend lines.
    - This feature highlights the scale and financial weight of the cryptocurrency industry over time.
4. **Volume & Value Indicators**:
    - The dashboard reports a **Volume of 54T** and a **Total Market Value of $503T**, offering a summarized snapshot of transaction flow and valuation.
    - Key stats like **$65K Market Cap**, intermediate values, and a lower bound of **$0** are shown to present a full picture of current and potential market states.
5. **User Engagement Tools**:
    - The year and coin filter options function well, allowing viewers to drill down into specific time periods or cryptocurrencies for focused analysis.
    - The interface supports dynamic interaction, giving users flexibility in examining detailed data based on personal or professional interests.

6. **Forecasting Insight**:
    - With projected trends shown on the market cap graph, users can visually anticipate potential future performance, aiding decision-making for investment or research purposes.

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- **Dashboard:**

Final Project Working Screenshots

GitHub Link

https://github.com/sure-trust/YUVARAJ-PODILI-g16-sql/tree/main

Learning and Reflection

Learning and Reflection

Throughout the development of the cryptocurrency dashboard, several key insights were gained:

- **Data Visualization Mastery**:
  Working with large datasets from the cryptocurrency market helped enhance our understanding of data visualization techniques. Implementing graphs such as line charts for price trends, open/close values, and market caps significantly deepened our knowledge of effective visual communication.
- **Tech Stack Integration**:
  The project required integrating multiple technologies and libraries (likely including Python, Power BI, or Tableau). This improved our technical fluency and problem-solving skills while handling real-time financial data.
- **Understanding Cryptocurrency Dynamics**:
  By tracking coins like Bitcoin, Ethereum, Dogecoin, etc., we gained a deeper understanding of market trends, volatility patterns, and the importance of volume and market cap in assessing financial health.
- **User-Centric Design**:
  Creating a user-friendly and interactive dashboard with time and coin-based filters taught us how to focus on usability. Ensuring clarity, responsiveness, and meaningful insights was a valuable lesson in designing for non-technical audiences.
- **Analytical Thinking**:
  The project strengthened our analytical capabilities by encouraging us to draw meaningful conclusions from price variations, volume surges, and historical market behavior.

Experience

This project provided a comprehensive, hands-on experience that blended finance, data analytics, and software development. It helped us realize how powerful dashboards can be in delivering insights and how data storytelling plays a key role in strategic decision-making. Collaborating as a team also honed our project planning and communication skills.

Conclusion and Future Scope

The cryptocurrency dashboard developed in this project serves as a powerful analytical tool for a wide range of users, including investors, financial analysts, researchers, and cryptocurrency enthusiasts. By consolidating large volumes of historical and predictive data into a visually rich and interactive interface, the dashboard significantly simplifies the complexity of the crypto market. Users can effortlessly monitor and compare key metrics such as price fluctuations, market capitalization, trading volumes, and trend predictions across various digital currencies.

The clean and intuitive visual design enhances the user experience, allowing for fast, informed decision-making without the need for extensive financial expertise. By leveraging charts, filters, and detailed metrics, the dashboard transforms raw data into meaningful insights that can support investment strategies, market trend analysis, and academic research.

Moreover, the successful implementation of this dashboard underscores the immense potential of data analytics in financial domains. It demonstrates how modern tools and visualization techniques can turn abstract financial data into actionable intelligence. The project not only meets its technical objectives but also highlights the relevance and importance of data-driven tools in today's fast-paced and data-centric economic environment. This solution bridges the gap between data availability and data comprehension, empowering users to make smarter, evidence-based financial decisions.

Future Scope

To enhance its functionality and impact, the dashboard can be expanded in several ways:

- **Live Data Integration**: Add real-time APIs to update the dashboard with the latest market data.
- **Prediction Models**: Incorporate machine learning models for price forecasting.
- **Mobile Compatibility**: Develop mobile-friendly versions for on-the-go access.
- **Expanded Metrics**: Include indicators like RSI, MACD, and volume-weighted average price.
- **Portfolio Tracker**: Add features to allow users to input and monitor personal crypto investments.

Future enhancements include integrating live updates, adding more currencies and exchanges, incorporating sentiment analysis from news/social media, and deploying the dashboard as a web application accessible on mobile and desktop platforms.

Achievements

- **Successfully Designed Cryptocurrency Dashboard**

Developed an interactive dashboard that visualizes historical cryptocurrency data, enabling users to explore market trends, coin performance, price fluctuations, and trading volume across major cryptocurrencies such as Bitcoin, Ethereum, XRP, and Dogecoin.

- **Advanced Data Modeling**

Built a structured data model with relationships across variables such as coin type, year, market cap, open/close prices, and trading volume. Implemented calculated fields and measures using DAX (or equivalent logic) to generate dynamic KPIs and year-wise comparisons.

- **Data Transformation and Cleaning**

Employed Power Query (or relevant data prep tools) to clean raw cryptocurrency datasets—handling nulls, correcting data formats, unifying column naming conventions, and transforming key fields for optimal dashboard performance and accuracy.

- **Insightful Visualizations**

Created meaningful and interactive visual elements including line charts, area graphs, pie charts, and map visuals that display high/low trends, market dominance, price shifts, and trading volumes across years and coins.

- **User-Friendly Interface**

Designed a clean and intuitive dashboard layout featuring filters and slicers for year, coin type, and metric selection—empowering users to explore data interactively and extract tailored insights effortlessly.

- **Demonstrated Analytical Thinking**

Uncovered valuable insights such as Bitcoin and Ethereum's dominance over the years, volatility trends during crypto booms, and market cap spikes—informing investment strategies, risk assessment, and financial analysis.

- **Scalability and Future-Readiness**

Engineered the dashboard to accommodate real-time crypto market data integration, predictive modeling for price trends, and extended metrics like user sentiment or transaction volume by geography in future updates.

- **Skill Development**

Enhanced proficiency in dashboard design, data visualization, DAX, and financial data analysis—strengthening expertise in data-driven decision-making within the fast-paced fintech and blockchain ecosystem.