Tech Saksham

Case Study Report

Data Analytics with Power BI

“Analysis Of Crypto Currency Growth In Last 5 Years ”

“Government Arts & Science College, Modakkurichi, Erode.”

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ABSTRACT

Crypto currency has emerged as a significant financial asset class, garnering attention for its Rapid growth and volatility. The proposed project, “Analysis of Crypto currency growth in last 5 years” aims to leverage Power BI, a leading business intelligence tool, to analyse the trajectory of crypto currency markets over the past five years. By leveraging BI techniques such as data visualization, trend analysis, and predictive modelling, this study aims to identify patterns, drivers, and potential future trends in crypto currency growth. Through comprehensive data analysis and visualization, insights gleaned from this research will contribute to a deeper understanding of the dynamics shaping the crypto currency landscape and inform investment strategies in this evolving market. We aim to uncover the key drivers influencing the rise and fall of various crypto currencies, including bitcoin, Ethereoum, and others. By examine the factors such as market capitalization, trending volume, regulatory development, technological advancements, and adoption rates, we seek to provide valuable insights into the evolving nature of the crypto currency market. Furthermore, this research aims to shed light on the potential implications of crypto currency growth for inventors, policymakers, and the broader financial ecosystem.

The past five years have witnessed significant developments and transformations in the Crypto currency landscape, marked by dynamic price movements, technological innovations, Regulatory shifts and evolving market sentiments. This study presents a comprehensive analysis of crypto currency growth from start year to end year, focusing on key metrics, trends and factors that have shaped the industry during this period.

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CHAPTER 1

INTRODUCTION

1.1 Problem Statement

In today's economies are all the money economies, because all economies have accepted Certain currencies (money) as medium of exchange. The money supply causes inflations as well as deflation in economies by its excess supply and construction in money supply, hence Currencies of different countries regulated by government in order to combat inflation or Deflation situations. Now a day's many countries in the world have focusing towards digital currency and transactions. Even some one doesn't want to regulate their currencies and transactions. This brought greater innovation in new currency that is crypto currency, one of the most advanced, ambiguities, regulation free currency. In this article I made an attempt to study regarding crypto currency and its development and transactions in India.

1.2 Proposed Solution

The proposed solution is to develop a Power BI dashboard that can analyse and visualize Crypto currency growth. Gather historical data on crypto currency prices, market capitalization, trading volume and relevant metrics from reliable sources such as exchanges, financial APIs and block chain data providers. Integrate this data into power BI using connectors or APIs to create a centralized and updated dataset for analysis. Utilize power BI's data visualization capabilities to create interactive dashboards and reports that display market trends over the past five years.

Integrate data from reputable sources such as crypto currency exchanges, financial API's and block chain explorers into power BI datasets. Utilize time series analysis, trend line analysis and comparative analysis features in power BI to identify key market events and patterns. Design a dedicated dashboard within power BI to explore technological advancements in block chain and crypto currency protocols. Visualize upgrades, protocols changes consensus mechanisms and scalability solutions implemented by major crypto currencies over time.

1.3 Features

1. **Increased Adoption:** Crypto currencies have gained wider acceptance and adoption across various sectors and industries, including finance, technology, retail, and more. Major companies and institutions have started accepting crypto currencies as a form of payment, contributing to their mainstream adoption.

2. **Block chain Technology Advancements:** The underlying block chain technology has Continued to evolve, leading to improved scalability, security, and efficiency. Advancements such as layer-two solutions, smart contracts, and interoperability protocols have enhanced the capabilities of block chain networks.

3. **Financial Infrastructure Integration:** Traditional financial institutions have shown Growing interest in crypto currencies. This includes the development of crypto currency-based financial products, investment funds, and integration with existing banking systems through initiatives like crypto custody services and regulatory frameworks.

4. **DeFi and NFTs:** The rise of Decentralized Finance (DeFi) platforms has unlocked new opportunities for users to engage in lending, borrowing, trading, and earning interest with crypto currencies, all while bypassing traditional financial intermediaries. Non-Fungible Tokens (NFTs) have also emerged as a significant trend, enabling digital ownership and unique asset tokenization.

5. **Global Economic Factors:** Economic uncertainties, inflation concerns, and geopolitical events in various parts of the world have fuelled interest in crypto currencies as alternative assets and hedges against traditional market risks.

6. **Institutional Investment:** Institutional investors and large corporations have started allocating capital to crypto currencies, contributing to increased liquidity, market maturity, and overall legitimacy of the asset class.

1.4 Advantages

- **Decentralization**: Crypto currencies operate on decentralized block chain networks, which means they are not controlled by any single entity or government. This decentralization fosters trust, transparency, and resilience, as transactions are recorded on a distributed ledger accessible to all participants.
- **Security:** Block chain technology provides robust security features such as Cryptographic encryption and consensus mechanisms (e.g., Proof of Work, Proof of Stake) that make it difficult for unauthorized parties to manipulate or tamper with Transaction data. This enhances the security and integrity of crypto currency transactions.
- **Borderless Transactions:** Crypto currencies facilitate borderless transactions, allowing users to send and receive funds across geographical boundaries without the need for intermediaries like banks or payment processors. This feature is particularly advantageous for international payments and remittances, reducing transaction costs and processing times.
- **Accessibility:** Crypto currencies have increased financial inclusivity by providing access to financial services for individuals who may be underserved or unbanked by traditional banking systems. Anyone with internet access can participate in the crypto currency ecosystem and manage their digital assets independently.
- **Lower Transaction Fees:** Crypto currency transactions typically involve lower fees compared to traditional banking and financial services, especially for cross-border transfers. This cost-effectiveness appeals to businesses and individuals looking to reduce overhead costs associated with payment processing.
- **Innovative Use Cases:** The versatility of block chain technology has led to the development of innovative use cases beyond simple payments. This includes Decentralized Finance (DeFi) platforms, Non-Fungible Tokens (NFTs), smart contracts, supply chain management, and identity verification solutions, among others. These use cases have expanded the utility and value proposition of crypto currencies.
- **Investment Opportunities**: Crypto currencies have emerged as alternative investment assets, offering potential returns and diversification opportunities for investors. The growth of crypto currency exchanges, investment products (e.g., |3crypto funds, ETFs), and liquidity in digital asset markets has attracted institutional and retail investors alike.
- **Global Interest and Awareness**: Increased media coverage, educational initiatives, and Community engagement have raised awareness about crypto currencies globally. This Heightened interest has led to greater participation, innovation, and infrastructure Development within the crypto currency ecosystem.

1.5 Scope

Analysing the scope for crypto currency growth over the last five years using Power BI can provide valuable insights into trends, market behaviour, and potential future opportunities. Power BI is a powerful data visualization tool that can help you create Interactive reports and dashboards based on historical crypto currency data. Use Power BI's Visualization tools to create interactive charts, graphs, and dashboards that provide insights into crypto currency growth over the last five years.

Time series analysis of crypto currency prices over the past five years, comparing different crypto currencies. Use Power BI's capabilities to analyse trends and patterns in crypto currency data. You can apply trend lines, moving averages, and statistical measures to identify long-term growth trends, volatility patterns, and cyclical behaviour within the crypto currency market. Utilize Power BI's forecasting capabilities to generate predictive models and forecasts for crypto currency prices or market trends.

This can help in assessing potential future growth opportunities and risks based on Historical data patterns. Build interactive dashboards in Power BI that allow users to explore and drill down into specific aspects of crypto currency growth. Include filters, slicers, and Dynamic elements that enable users to customize their views and extract actionable insights From the data.

CHAPTER 2

SERVICES AND TOOLS REQUIRED

2.1 Services Used

• **Data Collection**: Start by collecting historical crypto currency data from reliable sources Such as crypto currency exchanges, market data providers, or APIs. You can gather data on key metrics like price movements, trading volumes, market capitalization, and historical trends for various crypto currencies (e.g., Bitcoin, Ethereum, Litecoin, etc.)

• **Data Sources**:

a. crypto currency Exchange Data: Obtain historical data from reputable crypto currency Exchanges such as Coin base, Binance, Kraken, Bitfinex, etc. This data includes price history, trading volumes, market depth, and order book information.

b. Market Data Providers: Utilize data from market data providers like CoinGecko, CoinMarketCap, CryptoCompare, etc., to gather comprehensive market metrics, Token information, and historical data for various crypto currencies.

c. Block chain Explorers: Access block chain explorers such as Ethers can (for Ethereum) Or Block chair (for Bitcoin) to retrieve block chain-specific data like transaction volumes, Network activity, smart contract interactions, and token transfers.

• **External Services and APIs:**

a. API Integrations: Integrate external APIs such as crypto currency price APIs, sentiment Analysis APIs, block chain data APIs, and financial news APIs to enrich your data analysis With real-time or historical external data.

b. Machine Learning Services: Utilize Azure Machine Learning services or external Machine learning platforms to build predictive models for crypto currency price forecasting, sentiment analysis, trend predictions, and anomaly detection. Integrate these Models into Power BI for advanced analytics.

• **Azure Services:**

a. Azure SQL Database: Store and manage large volumes of crypto currency data in Azure SQL Database for scalability and performance.

b. Azure Data Lake Storage: Store unstructured or semi-structured data related to crypto currencies in Azure Data Lake Storage for further processing and analysis.

c. Azure Stream Analytics: Process real-time streaming data from crypto currency exchanges or block chain networks using Azure Stream Analytics, and visualize the results in Power BI dashboards in near real-time.

• **Data Analysis and Forecasting Tools:**

a. Time Series Analysis: Perform time series analysis using Power BI's built-in capabilities or integrate R or Python scripts for advanced time series analysis and forecasting.

b. Statistical Analysis: Use statistical functions and tools within Power BI for statistical analysis, correlation analysis, regression analysis, and hypothesis testing related to crypto currency growth factors.

c. Predictive Modelling: Develop predictive models for crypto currency price predictions, Market sentiment analysis, volatility forecasting, and trend analysis using Power BI's machine learning capabilities or external machine learning platforms.

• **Collaboration and Sharing**:

a. Power BI Service: Publish and share Power BI reports and dashboards on Power BI Service for collaborative analysis and sharing insights with stakeholders.

b. Power BI Embedded: Embed Power BI dashboards and reports into custom applications or websites to extend the reach of your crypto currency analysis to a wider audience.

2.2 Tools and Software used

Tools:

- **Power BI**: The main tool for this project is Power BI, which will be used to create interactive dashboards for real-time data visualization.
- **Power Query**: This is a data connection technology that enables you to discover, connect, combine, and refine data across a wide variety of sources.

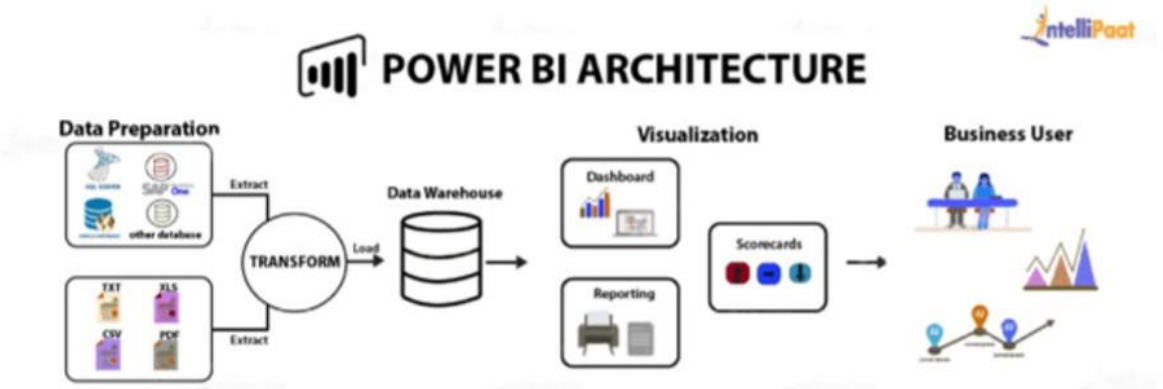
Software Requirements:

- **Power BI Desktop**: This is a Windows application that you can use to create reports and publish them to Power BI.
- **Power BI Service**: This is an online SaaS (Software as a Service) service that you use to publish reports, create new dashboards, and share insights.
- **Power BI Mobile**: This is a mobile application that you can use to access your reports and dashboards on the go.

CHAPTER 3

PROJECT ARCHITECTURE

3.1 Architecture



Here's a high-level architecture for the project:

1. **Data Collection and Integration**: Gather data from various sources such as crypto currency exchanges, APIs, financial databases, and public datasets. Integrate the data into a centralized repository for analysis.
2. **Data Preparation and Cleaning**: Cleanse the data to remove duplicates, error, and inconsistencies. Handle missing values and outliers appropriately. Transform the data into a sustainable format for analysis.
3. **Data Modeling**: Design a data model to represent the relationships between different data entities. Define measures and calculated columns for analysis.
4. **Analysis and Visualization**: Utilize power BI visualization tools to create insightful dashboards and reports. Analyze trend and pattern, and correlations in crypto currency growth over the past five years.
5. **Forecasting and Predictive Modeling**: Apply forecasting techniques to predict future crypto currency growth trends. Use machine learning algorithms to identify potential predictions of crypto currency performance. Evaluate model accuracy and adjust as necessary.
6. **Performance monitoring and Optimization**: Implement monitoring mechanisms to track the performance of the power BI reports and dashboards. Collect users' feedback

to identify area for implement and optimization. Continues refine the analysis based on new data and emerging trends in the crypto currency market.

7. **Deployment and Distribution**: Deploy the Power BI project to suitable platform for distribution, such as Power BI service or SharePoint. Share the insights and findings with stakeholders through the scheduled reports, email subscripts, or embedded dashboards.
8. **Security and Governance**: Implement appropriate security measures to protect sensitive data and ensure compliance with the regulatory requirements. Establish governance policies for data access, sharing, and collaboration within the Power BI environment

By following this architecture, you can create a comprehensive analysis of crypto currency growth over the last five years using the Power BI , providing valuable insights to stakeholders and decision makers.

CHAPTER 4

MODELING AND RESULT

Manage relationship

Investor relations

• Communicate regularly with investors provide updates on project milestones, financial performance and growth strategies.

• Organize investor meetings, webinars, and Q&A sessions to address investor queries and concerns.

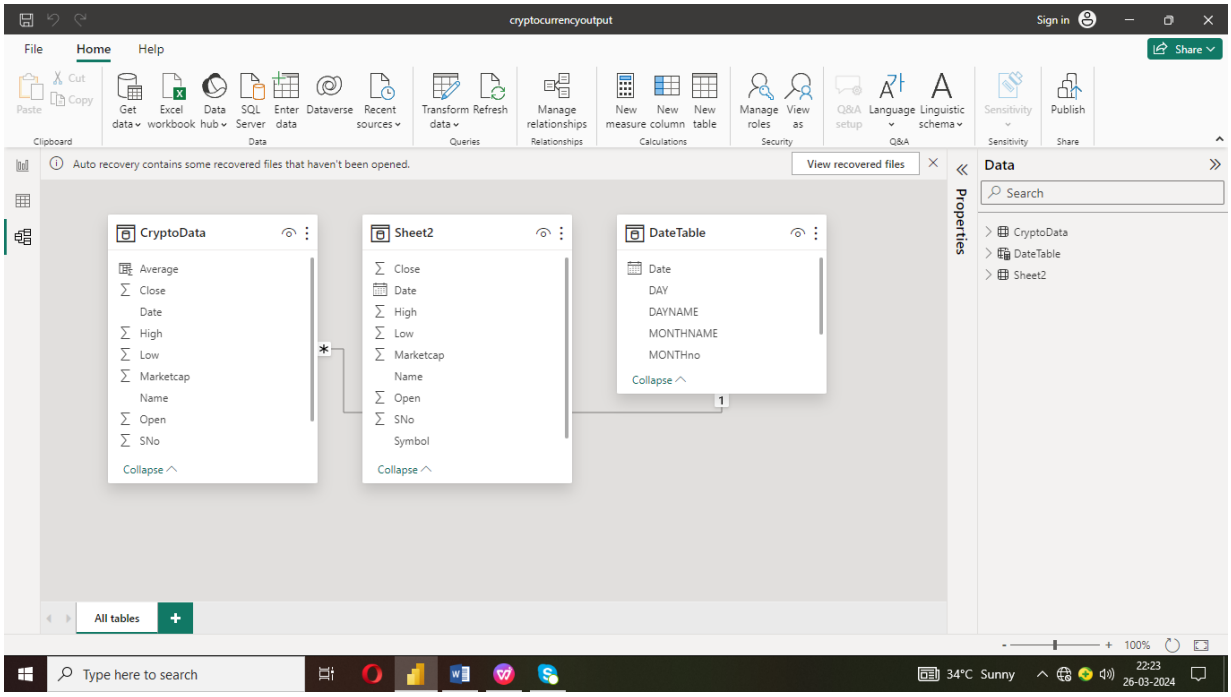
• Develop transparency in reporting financials, token metrics, and governance structures to build trust and credibility

Transparency and communication

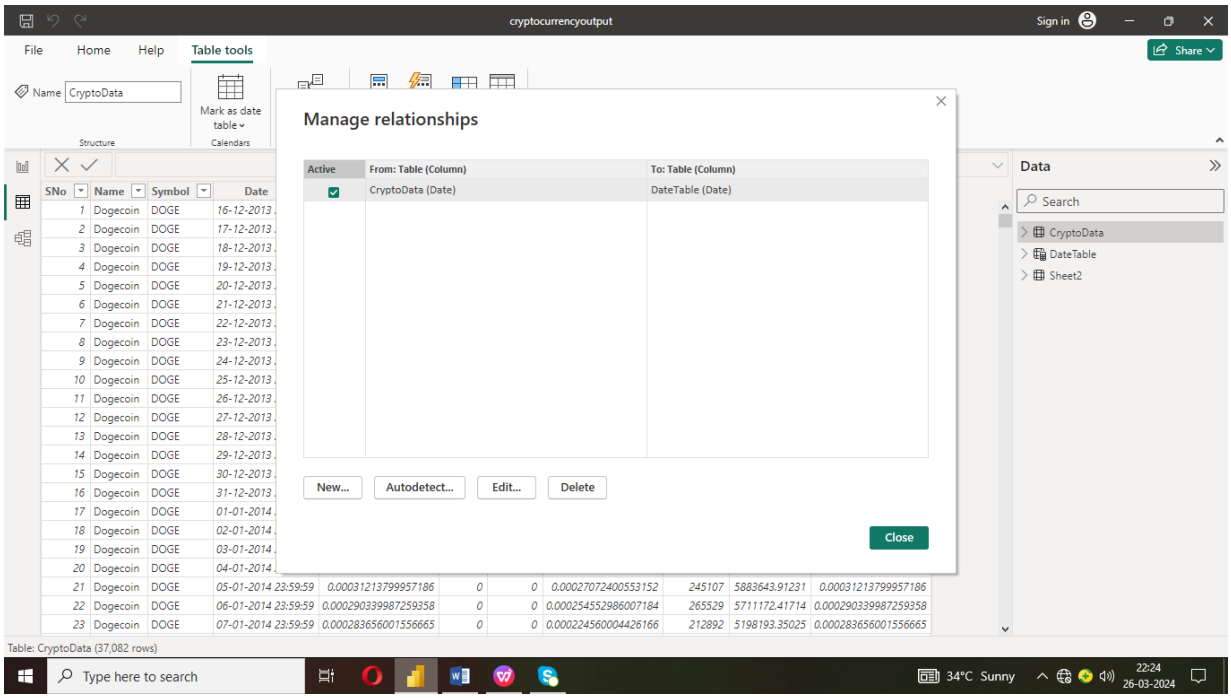
• Maintain transparency in project developments, token comics, roadmap execution, and decision making processes.

Community management

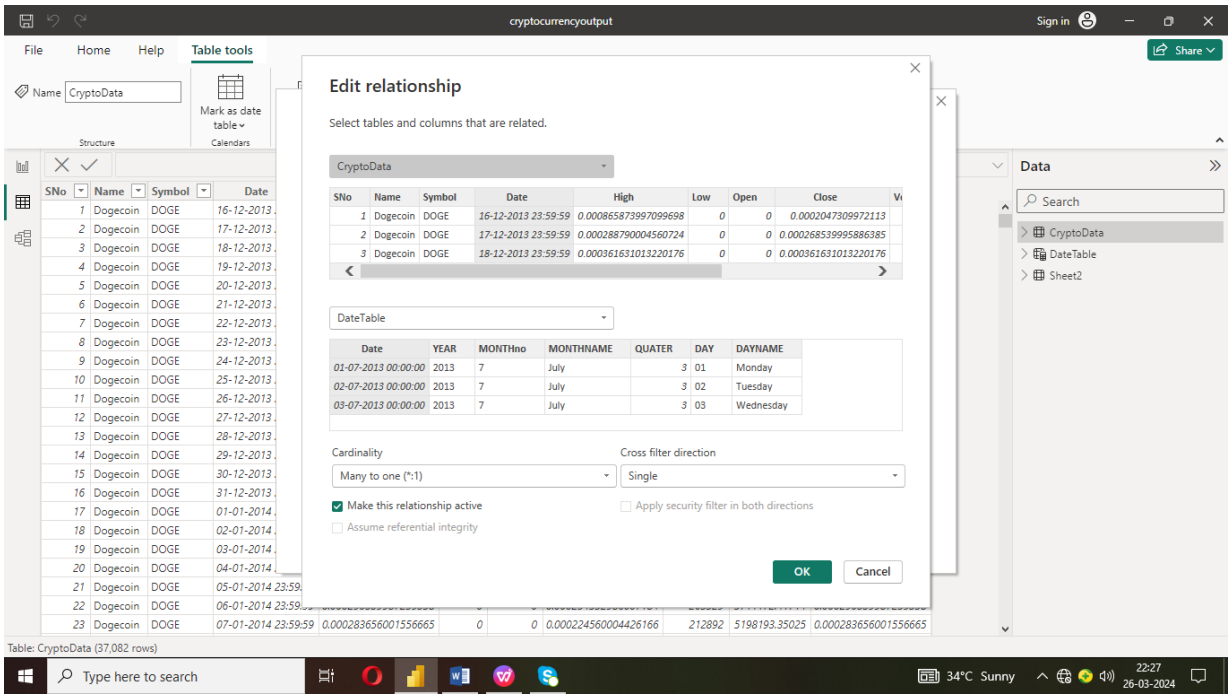
• Have a dedicated community management team to interact with community members, moderate discussions and address community concerns.



MANAGE RELATIONSHIP

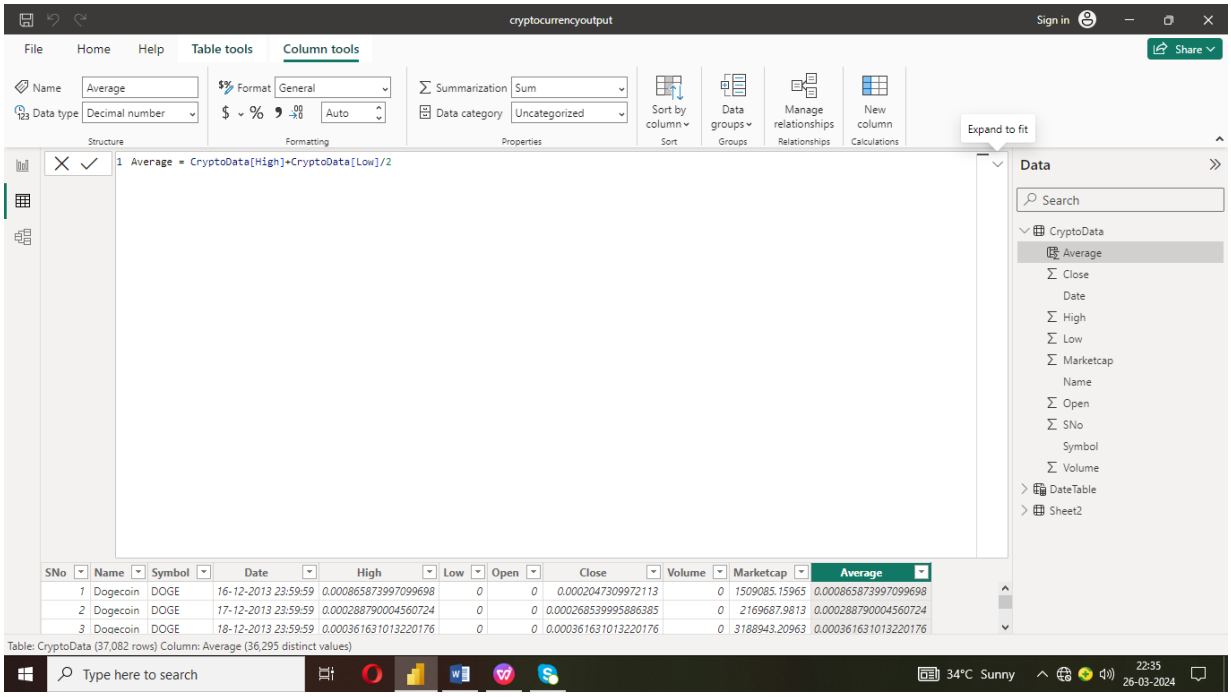


EDIT RELATIONSHIP

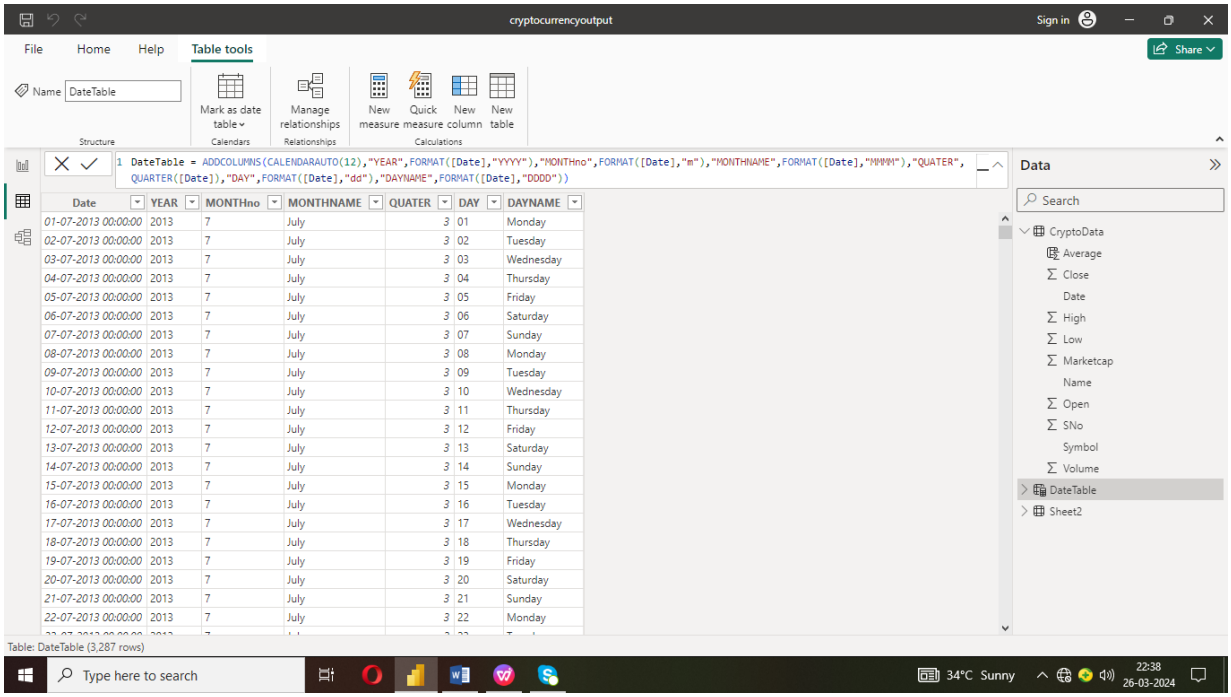


Modelling for Average and Date Table

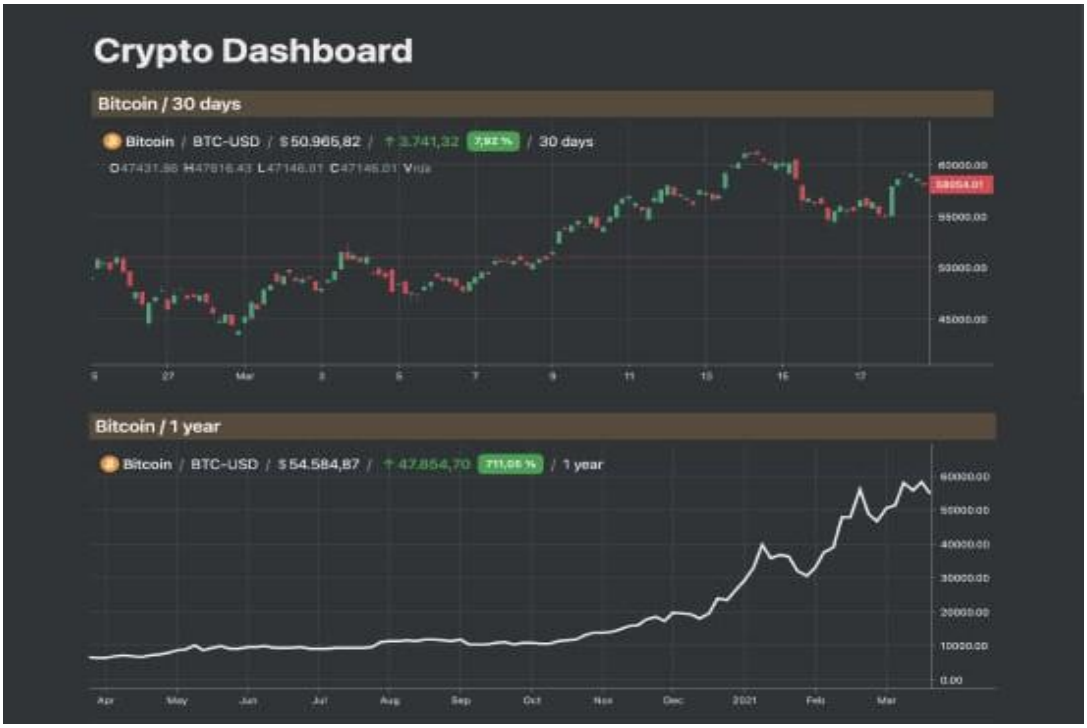
Notice that the Average and Date Table are missing from the data. We can create a average table by calculating crypto high and crypto low values,

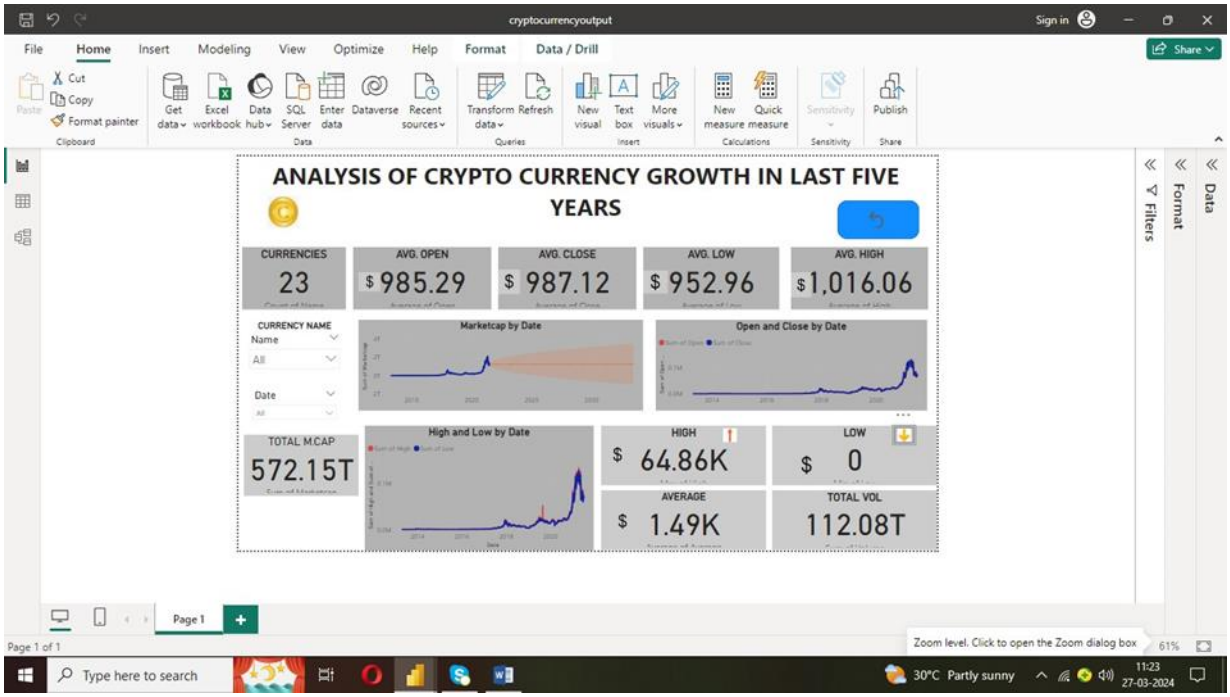


We can also create a date table to show the difference of the crypto currency in date wise. So we add date by using “dd”, adding month by “mm” and adding year by using “yyyy”



Dashboard





CONCLUSION

In conclusion, while the crypto currency market has witnessed significant growth and Innovation over the past five years, ongoing developments, regulatory changes, and market dynamics will continue to shape its future trajectory. Data-driven analysis using tools like Power BI can help stakeholders navigate the complexities of the crypto currency market and identify opportunities for growth and investment. The crypto currency market has experienced substantial growth over the past five years, marked by increasing adoption, market capitalization, and trading volumes. This expansion is evident across major crypto currencies such as Bitcoin, Ethereum, and others. Crypto currency prices have exhibited significant volatility, characterized by rapid price fluctuations and market cycles. Analysing historical price data reveals trends, patterns, and cycles that can help predict future market movements to some extent.

The last five years have witnessed growing institutional interest and investment in crypto currencies. Institutional adoption, along with regulatory developments and infrastructure improvements, has contributed to market stability and legitimacy. The crypto currency ecosystem has diversified beyond basic digital currencies, with the emergence of innovative technologies such as DeFi platforms, NFTs, and block chain applications in various industries. These innovations have expanded the utility and use cases of crypto currencies. Utilizing tools like Power BI for data analysis provides data driven insights into market trends, correlations, and forecasting, enabling informed decision making and risk management strategies in the dynamic crypto currency landscape.

By this project plan, stakeholders will gain valuable insights into the growth and performance of crypto currencies over the last five years. The analysis provided by Power BI will enable informed decision-making and strategic planning in the crypto currency market.

FUTURE SCOPE

Gather historical crypto currency data from reliable sources covering the last five years. Include data on key metrics such as price movements, trading volumes, market capitalization, and relevant market indicators for major crypto currencies like Bitcoin, Ethereum, etc. Clean and prepare the collected data for analysis in Power BI. This involves data cleaning, handling missing values, structuring the data into appropriate tables, and ensuring data quality before importing it into Power BI. Create a data model in Power BI that includes relevant tables and establishes relationships between them based on your crypto currency data. Consider creating separate tables for daily price data, trading volumes, market indicators, and any additional data you plan to analyse. Utilize Power BI's visualization capabilities to analyse and visualize the future scope for crypto currency growth. Use Power BI's forecasting capabilities to generate predictive models and forecasts for crypto currency prices or market trends.

Apply forecasting techniques such as exponential smoothing or ARIMA models to project future price movements based on historical data patterns. Conduct scenario analysis using Power BI to assess different potential scenarios for crypto currency growth based on varying assumptions or external factors. This can help in evaluating the resilience of crypto currency markets to different market conditions and events. Build interactive dashboards in Power BI that allow stakeholders to explore different aspects of future crypto currency growth scenarios. Include filters, slicers, and dynamic elements that enable users to customize their views and simulate different scenarios or analyses specific segments of the crypto currency market.

Explore the integration of block chain analytics tools to analyse on-chain data and transactions, providing insights into crypto currency network activity and emerging trends. By incorporating these future enhancements, the project can evolve to provide even more valuable insights into crypto currency growth and market dynamics over the next five years, enabling stakeholders to make more informed decisions and stay ahead in the rapidly evolving crypto currency landscape.

