Case Study Report

Data Analytics with Power BI

“Analysis of Crypto Currency Growth in Last 5 Year

(Data Analytics with Power BI)”

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ABSTRACT

Cryptocurrency has revolutionized the financial landscape, presenting a unique investment opportunity with its dynamic market behavior. This project endeavors to conduct a thorough analysis of cryptocurrency growth trends spanning the past five years, leveraging the power of data analytics with Microsoft Power BI.

The study will encompass a comprehensive examination of key cryptocurrencies, including Bitcoin, Ethereum, Ripple, and Litecoin, among others. By harnessing historical data from [start date] to [end date], we aim to extract valuable insights into market performance, price fluctuations, adoption rates, and sentiment analysis.

Through the implementation of Power BI's advanced visualization tools, we will create intuitive dashboards and reports to present our findings effectively.

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CHAPTER 1

INTRODUCTION

1.1 Problem Statement

In the fast-paced world of cryptocurrency, understanding market trends and behaviors is critical for making informed trading and investment decisions. However, analyzing the vast and constantly changing data in the cryptocurrency market presents significant challenges. Traditional analysis methods are often slow and cannot provide real-time insights. This lack of real-time analysis can result in missed opportunities for profitable trades and optimal investment strategies, impacting overall success in the cryptocurrency market. Furthermore, the complex and diverse nature of cryptocurrency data, including price fluctuations, trading volumes, and market sentiment, adds to the difficulty of data analysis.

1.2 Proposed Solution

The proposed solution involves developing a PowerBI dashboard to analyze and visualize real-time cryptocurrency market data. This dashboard will integrate data from various sources, including price movements, trading volumes, and market sentiment. It aims to provide a comprehensive view of market behavior, trends, and opportunities, empowering traders and investors to make informed decisions. The dashboard will be interactive, user-friendly, and customizable, allowing users to adjust it to their specific requirements. Its real-time analysis capabilities will enable users to promptly respond to changes in market conditions, identify profitable trading opportunities, and optimize their investment strategies.

1.3 Feature

- **Real-Time Analysis:** The dashboard offers real-time analysis of cryptocurrency market data.
- **Market Segmentation:** It segments market data based on various parameters like price movements, trading volumes, and market sentiment.
- **Trend Analysis:** The dashboard identifies and displays trends in cryptocurrency market behavior.
- **Predictive Analysis**: It uses historical market data to predict future price movements and market trends.

1.4 Advantages

- **Data-Driven Decisions:** The dashboard enables data-driven decisions based on real-time cryptocurrency market analysis.
- **Enhanced Market Engagement:** Understanding market behavior and trends can help traders and investors engage more effectively with the cryptocurrency market.
- **Revenue Optimization:** By identifying opportunities for profitable trades and optimal investment strategies, users can potentially increase their revenue in the cryptocurrency market.

1.5 Scope

The scope of this project encompasses all cryptocurrency market participants seeking to utilize data for decision-making and market engagement. The project can be expanded to include additional data sources and advanced analytics methods, such as machine learning and artificial intelligence, to offer more intricate insights into market behavior. It also has the potential to be adapted for other sectors, such as retail, healthcare, and telecommunications, where understanding market trends is essential. Additionally, the project contributes to the broader goal of digital transformation in the cryptocurrency market, promoting efficiency, innovation, and market-centric strategies.

CHAPTER 2

SERVICES AND TOOLS REQUIRED

2.1 Services Used

- **Data Collection and Storage Services:** Cryptocurrency market participants need to collect and store market data in real-time. This could be achieved through services like Azure Data Factory, Azure Event Hubs, or AWS Kinesis for real-time data collection, and Azure SQL Database or AWS RDS for data storage.
- **Data Processing Services:** Services like Azure Stream Analytics or AWS Kinesis Data Analytics can be used to process the real-time market data.
- **Machine Learning Services:** Azure Machine Learning or AWS SageMaker can be used to build predictive models based on historical market data.

2.2 Tools and Software used

Tools:

- **PowerBI**: The main tool for this project is PowerBI, 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.

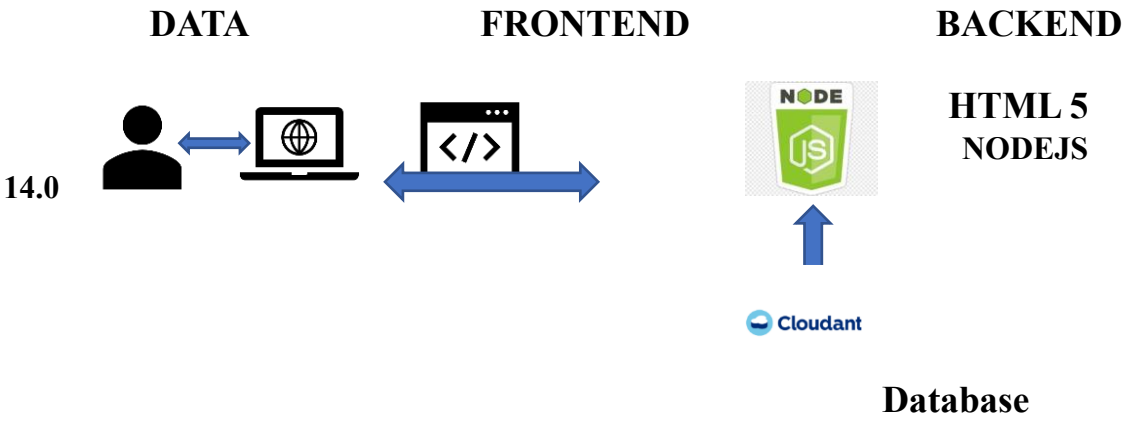
Software Requirements:

- **PowerBI Desktop**: This is a Windows application that you can use to create reports and publish them to PowerBI.
- **PowerBI Service**: This is an online SaaS (Software as a Service) service that you use to publish reports, create new dashboards, and share insights.
- **PowerBI 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**: Real-time cryptocurrency market data is collected from various sources such as exchanges, APIs, and blockchain data. This can be achieved using services like Azure Event Hubs or AWS Kinesis.

2. **Data Storage**: The collected cryptocurrency market data is stored in a database for processing. Azure SQL Database or AWS RDS can be used for this purpose.

3. **Data Processing:** The stored cryptocurrency market data is processed in realtime using services like Azure Stream Analytics or AWS Kinesis Data Analytics.

4. **Machine Learning:** Predictive models are built based on processed data using Azure Machine Learning or AWS SageMaker. These models can help in predicting market trends, identifying trading opportunities, etc.

5. **Data Visualization:** The processed data and the results from the predictive models are visualized in real-time using PowerBI. PowerBI allows you to create interactive dashboards that can provide valuable insights into the cryptocurrency market.

6. **Data Access:** The dashboards created in PowerBI can be accessed through PowerBI Desktop, PowerBI Service (online), and PowerBI Mobile.

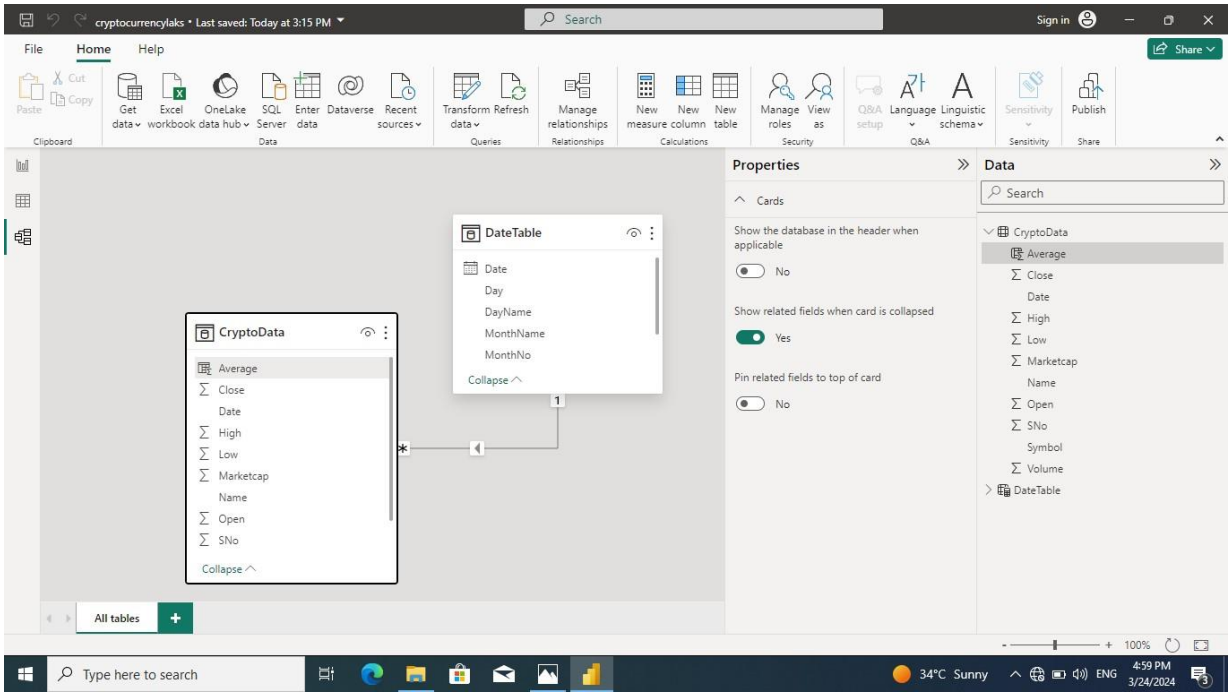
This architecture provides a comprehensive solution for real-time analysis of cryptocurrency market data. However, it's important to note that the specific architecture may vary depending on the participant's existing infrastructure, specific requirements, and budget. It's also important to ensure that all tools and services comply with relevant data privacy and security regulations.

CHAPTER 4

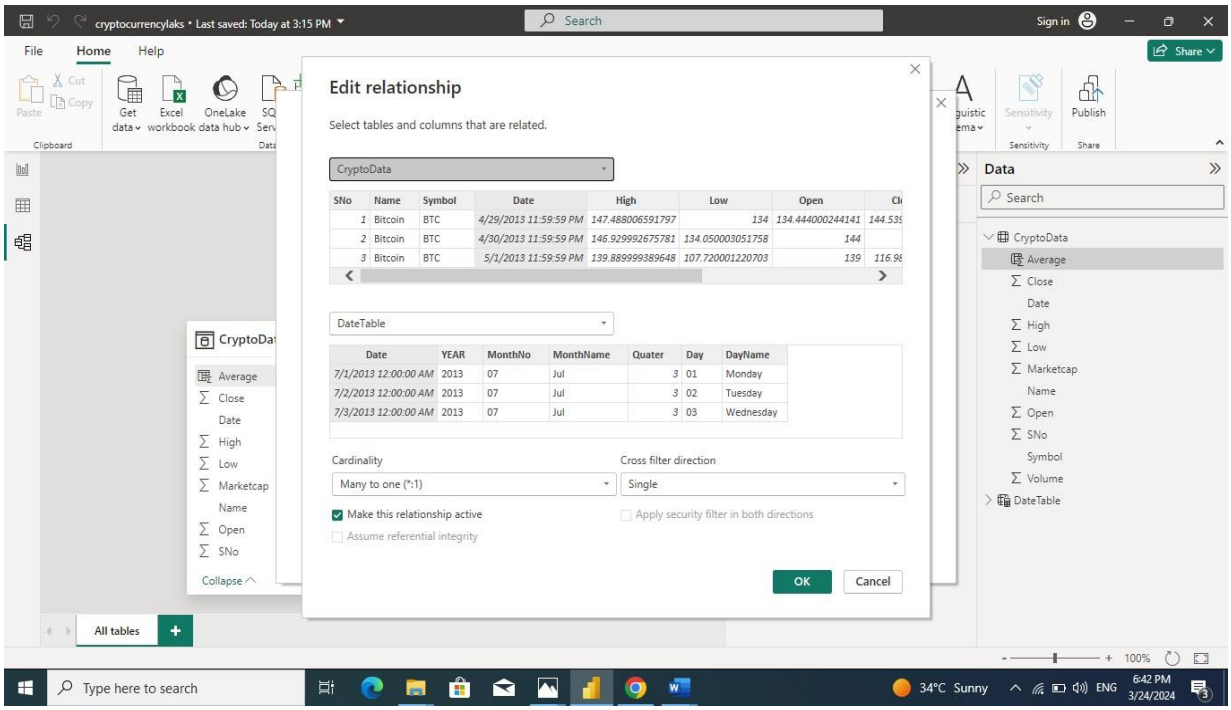
MODELING AND RESULT

Manage relationship

The “CryptoData” file will be used as the main connector as it contains most key identifier (name,Date.M.Cap) which can be use to relates the 8 data files together. The “Date Table” file is use to link the Date geographically with “Date”.

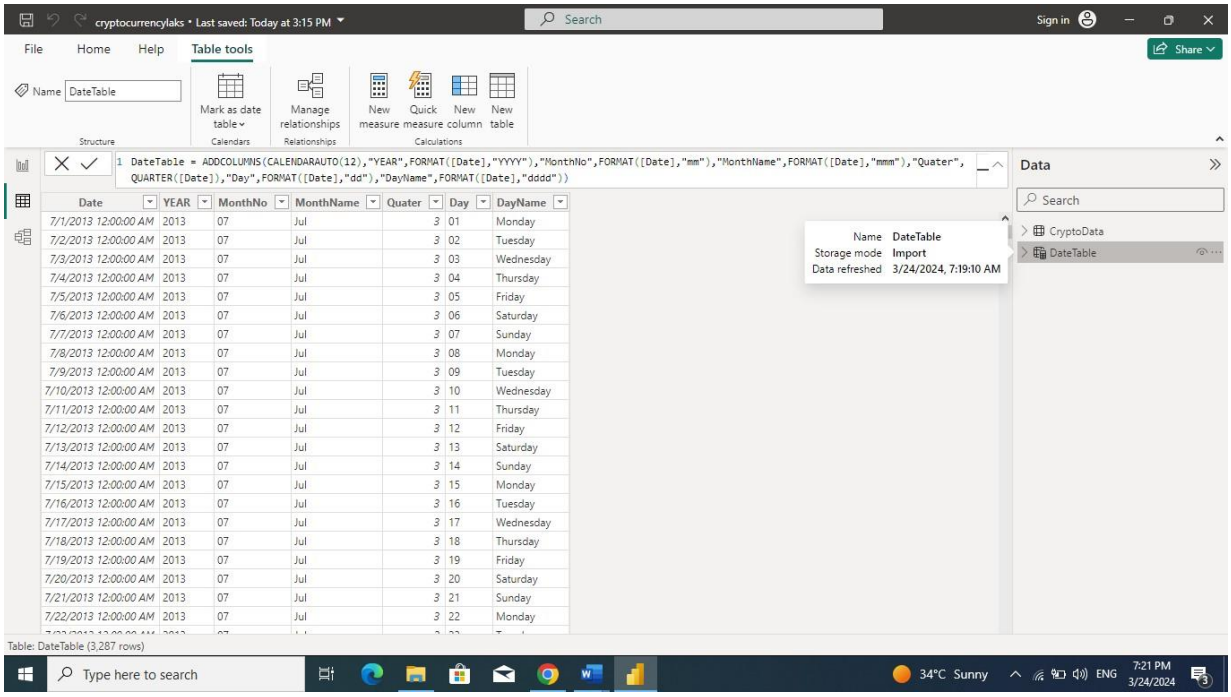


Manage Relationship

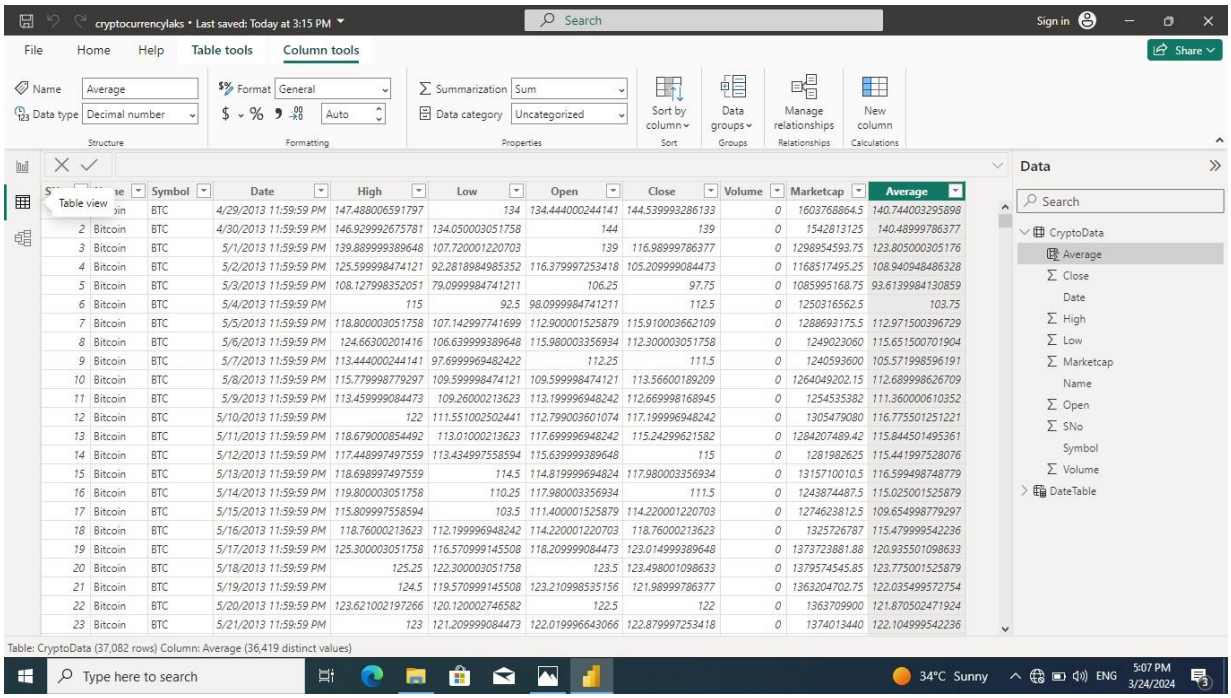


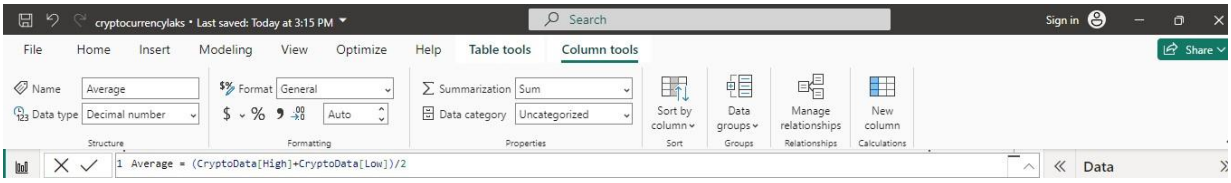
Modelling for Data

Notice that a table is created for date. These can be formulated from the Date YYMMDD . We can create a column for Month,Day.

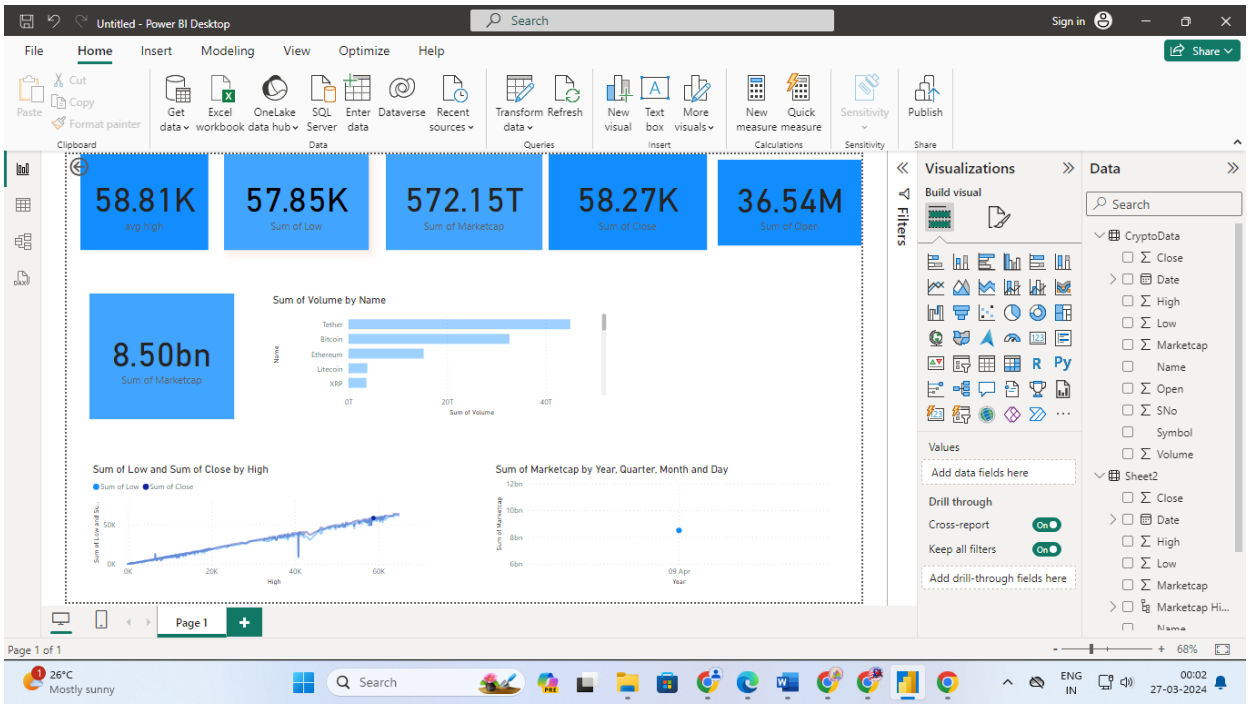


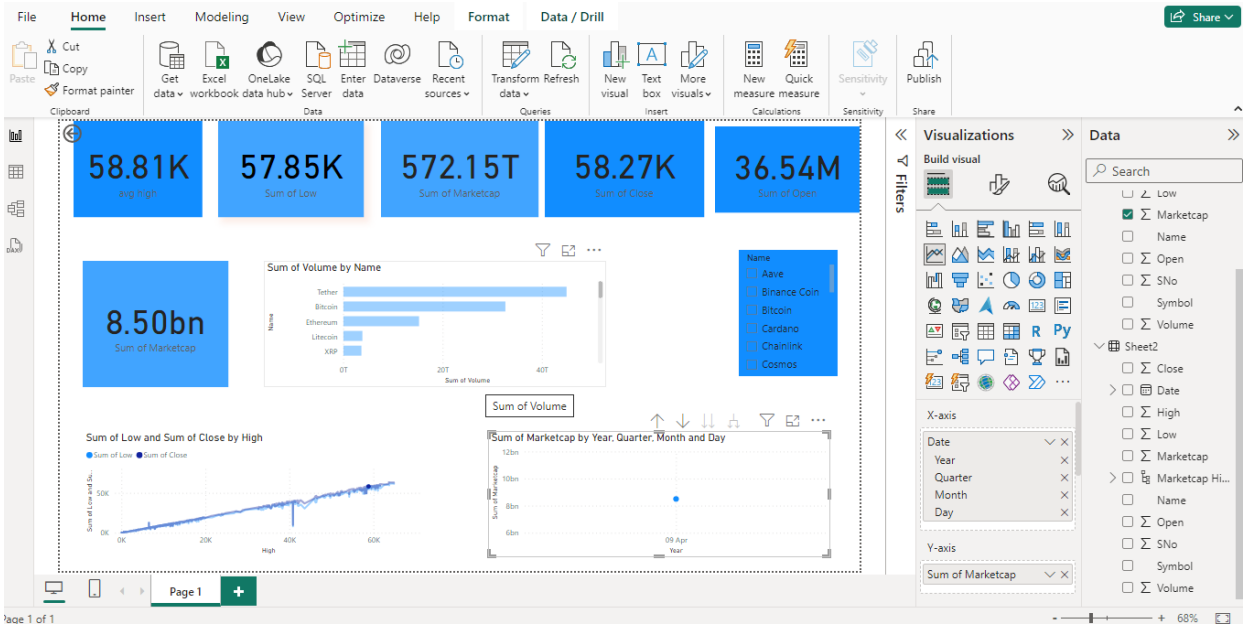
Adding a column





Dashboard





5. CONCLUSION

The project "Real-Time Analysis of Cryptocurrency Market" using PowerBI has successfully demonstrated the potential of data analytics in the cryptocurrency market. The real-time analysis of market data has provided valuable insights into market behavior, trends, and opportunities, thereby facilitating informed trading and investment decisions. The interactive dashboards and reports have offered a comprehensive view of market data, enabling the identification of patterns and correlations. This has not only improved the efficiency of data analysis but also enhanced the ability of market participants to optimize their trading strategies. The project has also highlighted the importance of data visualization in making complex market data more understandable and accessible. The use of PowerBI has made it possible to present data in a visually appealing and easy-to-understand format, aiding in better decision-making in the cryptocurrency market.

6. FUTURE SCOPE

The future scope of this project is vast. With the advent of advanced analytics and machine learning, PowerBI can be leveraged to predict future trends in the cryptocurrency market based on historical data. Integrating these predictive analytics into the project could enable market participants to anticipate market movements and make more informed trading decisions. Furthermore, PowerBI's capability to integrate with various data sources opens up the possibility of incorporating more diverse datasets for a more holistic view of the cryptocurrency market. As data privacy and security become increasingly important, future iterations of this project should focus on implementing robust data governance strategies. This would ensure the secure handling of sensitive market data while complying with data protection regulations. Additionally, the project could explore the integration of real-time data streams to provide even more timely and relevant insights. This could potentially revolutionize the way market participants engage with the cryptocurrency market, leading to improved trading strategies and profitability.

