

## Case Study Report

# Data Analytics with Power BI

**“Analysis of Crypto Currency Growth in Last 5 Year**

**(Data Analytics with Power BI)”**

**“Shri Nehru Maha Vidyalaya College of Arts and Science”**

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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.

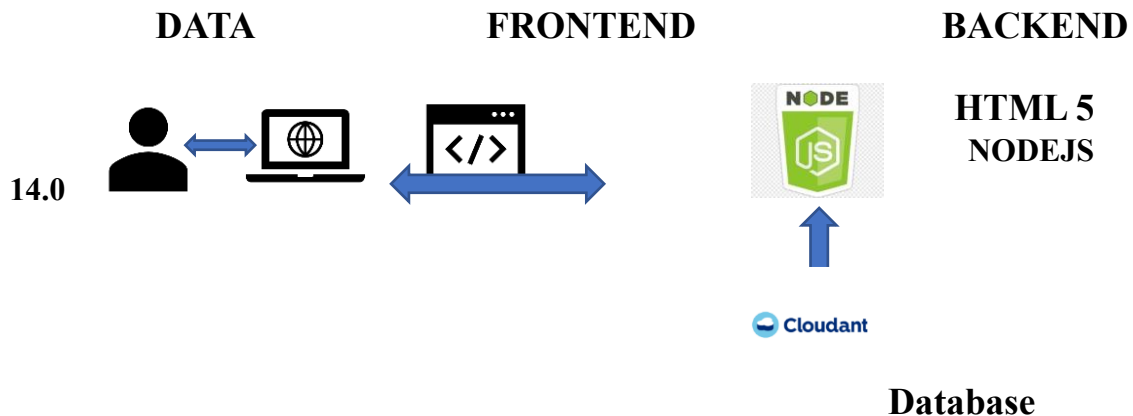
##### Software Requirements:

- **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.

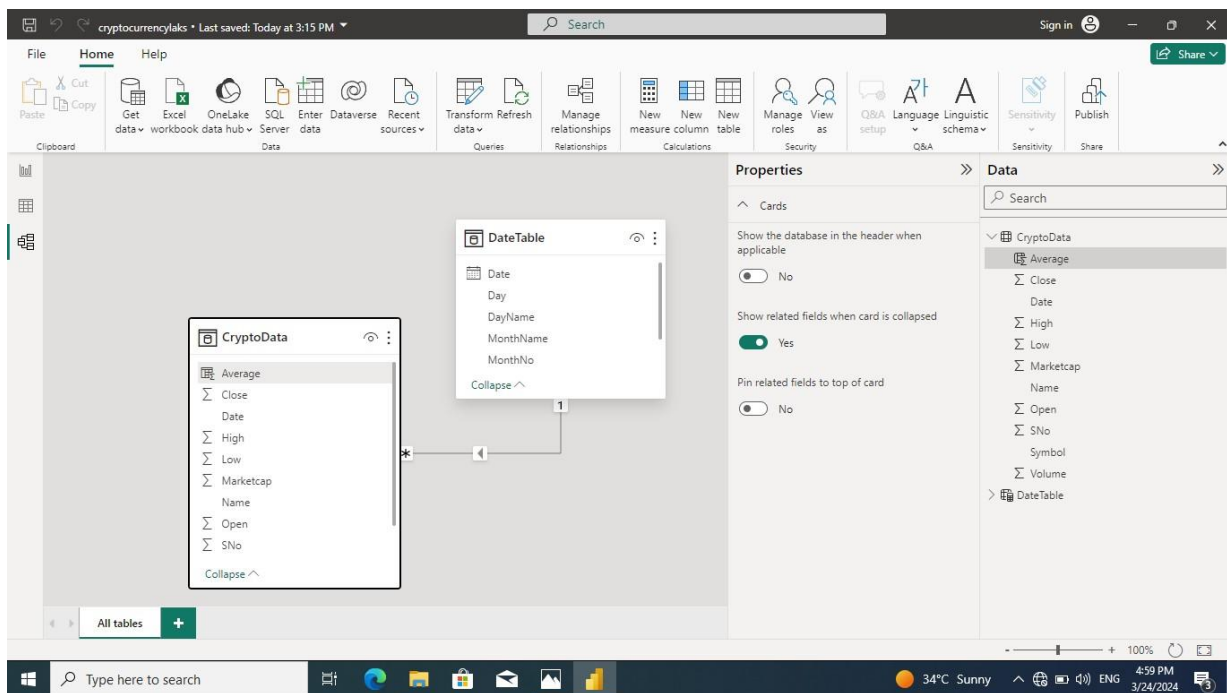


## CHAPTER 4

### 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

**Edit relationship**

Select tables and columns that are related.

**CryptoData**

SNo	Name	Symbol	Date	High	Low	Open	Close
1	Bitcoin	BTC	4/29/2013 11:59:59 PM	147.488006591797		134	134.444000244141
2	Bitcoin	BTC	4/30/2013 11:59:59 PM	146.929992675781	134.050003051758		144
3	Bitcoin	BTC	5/1/2013 11:59:59 PM	139.889999389648	107.720001220703	139	116.96

**DateTable**

Date	YEAR	MonthNo	MonthName	Quarter	Day	DayName
7/1/2013 12:00:00 AM	2013	07	Jul	3	01	Monday
7/2/2013 12:00:00 AM	2013	07	Jul	3	02	Tuesday
7/3/2013 12:00:00 AM	2013	07	Jul	3	03	Wednesday

Cardinality: Many to one (\*:1) Cross filter direction: Single

☒ Make this relationship active ☐ Assume referential integrity ☐ Apply security filter in both directions

OK Cancel

## Modelling for Data

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

cryptocurrencylaks • Last saved: Today at 3:15 PM

File Home Help Table tools

Name: DataTable

Structure: 1 DataTable = ADDCOLUMNS(CALENDAR(AUTO(12),"YEAR",FORMAT([Date],"YYYY"),"MonthNo",FORMAT([Date],"mm"),"MonthName",FORMAT([Date],"mmm"),"Quarter",QUARTER([Date]),"Day",FORMAT([Date],"dd"),"DayName",FORMAT([Date],"dddd"))

Table: DataTable (3,287 rows)

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cryptocurrencylaks • Last saved: Today at 3:15 PM

File Home Insert Modeling View Optimize Help Table tools

Name: DataTable

Structure: 1 DataTable = ADDCOLUMNS(CALENDAR(AUTO(12),"YEAR",FORMAT([Date],"YYYY"),"MonthNo",FORMAT([Date],"mm"),"MonthName",FORMAT([Date],"mmm"),"Quarter",QUARTER([Date]),"Day",FORMAT([Date],"dd"),"DayName",FORMAT([Date],"dddd"))

## Adding a column

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File Home Help Table tools Column tools

Name: Average

Data type: Decimal number

Format: General

Summarization: Sum

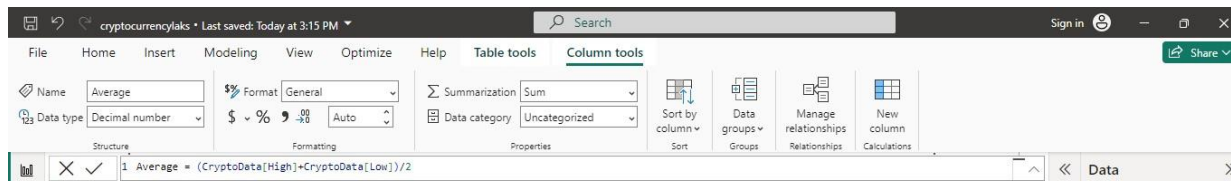
Data category: Uncategorized

Table view

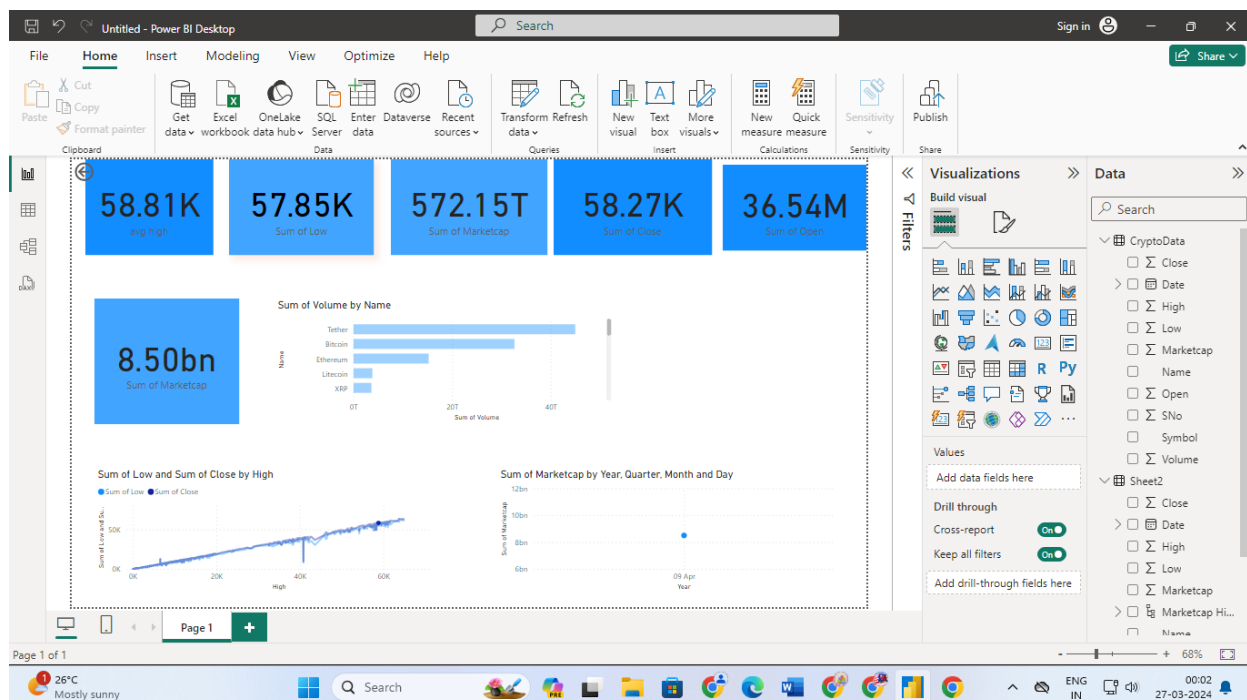
Symbol	Date	High	Low	Open	Close	Volume	Marketcap	Average
BTC	4/29/2013 11:59:59 PM	147.488006591797	134	134.444000244141	144.539993286133	0	1603768864.5	140.744003295898
BTC	4/30/2013 11:59:59 PM	146.929992675781	134.050003051758	144	139	0	1542813125	140.48999786377
BTC	5/1/2013 11:59:59 PM	139.889999389648	107.720001220703	139	116.98999786377	0	1298954593.75	123.805000305176
BTC	5/2/2013 11:59:59 PM	125.599998474121	92.2818984985352	116.379997253418	105.209999084473	0	1168517495.25	108.940948486328
BTC	5/3/2013 11:59:59 PM	108.127998352051	79.0999984741211	106.25	97.75	0	1085995168.75	93.6139984130859
BTC	5/4/2013 11:59:59 PM	115	92.5	98.0999984741211	112.5	0	1250316562.5	103.75
BTC	5/5/2013 11:59:59 PM	118.800003051758	107.142997741699	112.900001525879	115.910003662109	0	1288693175.5	112.971500396729
BTC	5/6/2013 11:59:59 PM	124.66300201416	106.639999389648	115.980003356934	112.300003051758	0	1249023060	115.651500701904
BTC	5/7/2013 11:59:59 PM	113.444000244141	97.69999969482422	112.25	111.5	0	1240593600	105.571998596191
BTC	5/8/2013 11:59:59 PM	115.779998779297	109.599998474121	109.599998474121	113.56600189209	0	1264049202.15	112.689998626709
BTC	5/9/2013 11:59:59 PM	113.459999084473	109.26000213623	113.1999998168945	112.669998168945	0	1254535382	111.360000610352
BTC	5/10/2013 11:59:59 PM	122	111.551002502441	112.799003601074	117.199996948242	0	1305479080	116.775501251221
BTC	5/11/2013 11:59:59 PM	118.679000854492	113.01000213623	117.699996948242	115.24299621582	0	1284207489.42	115.844501495361
BTC	5/12/2013 11:59:59 PM	117.448997497559	113.434997558594	115.639999389648	115	0	1281982625	115.441997528076
BTC	5/13/2013 11:59:59 PM	118.698997497559	114.5	114.819999694824	117.980003356934	0	1315710010.5	116.599498748779
BTC	5/14/2013 11:59:59 PM	119.800003051758	110.25	117.980003356934	111.5	0	1243874487.5	115.025001525879
BTC	5/15/2013 11:59:59 PM	115.809997558594	103.5	111.400001525879	114.220001220703	0	1274623812.5	109.654998779297
BTC	5/16/2013 11:59:59 PM	118.76000213623	112.199996948242	114.220001220703	118.76000213623	0	1325726787	115.479999542236
BTC	5/17/2013 11:59:59 PM	125.300003051758	116.570999145508	118.209999084473	123.014999389648	0	1373723881.88	120.935501098633
BTC	5/18/2013 11:59:59 PM	125.25	122.300003051758	123.5	123.498001098633	0	1379574545.85	123.775001525879
BTC	5/19/2013 11:59:59 PM	124.5	119.570999145508	123.210998535156	121.98999786377	0	1363204702.75	122.035499572754
BTC	5/20/2013 11:59:59 PM	123.621002197266	120.120002746582	122.5	122	0	1363709900	121.870502471924
BTC	5/21/2013 11:59:59 PM	123	121.209999084473	122.019996643066	122.879997253418	0	1374013440	122.104999542236

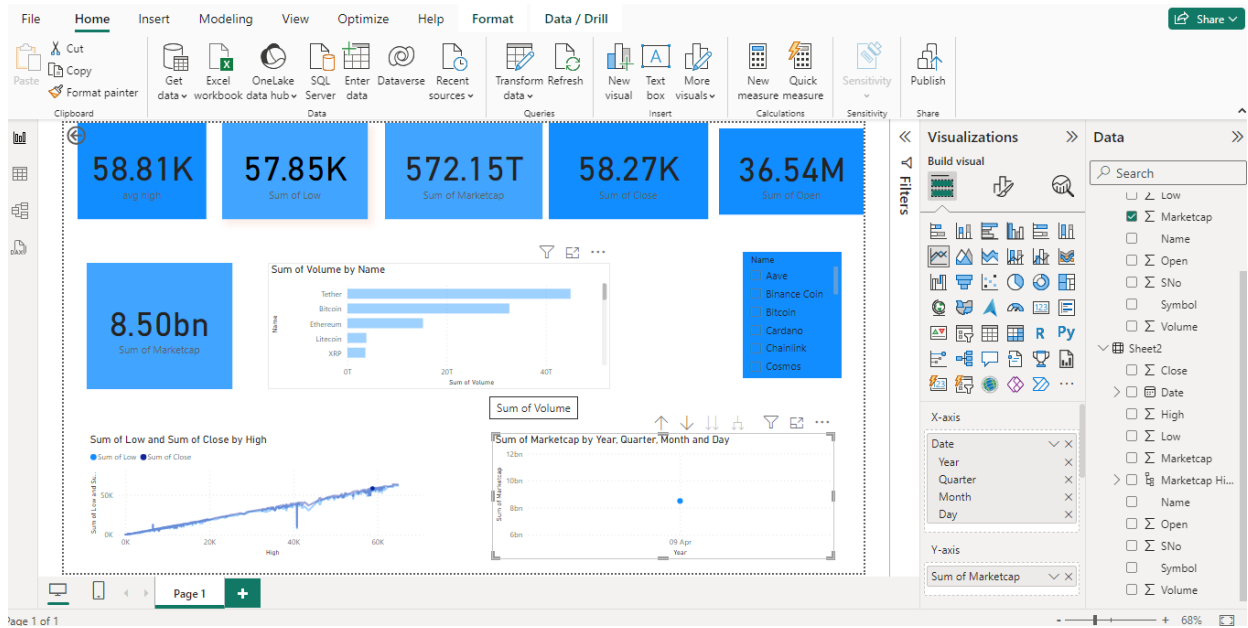
Table: CryptoData (37,082 rows) Column: Average (36,419 distinct values)

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## 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.

## 7. REFERENCES

<https://www.novopro.com/project/crypto-dashboard-2>

<https://www.atharvasystem.com/>