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Process Automation for instant Procurement of Crypto currencies

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Abstract: Cryptocurrencies have been a global trend since inception and have emerged as important pecuniary software systems. Cryptocurrencies lack a central authority to mediate transactions because they were designed as peer-to-peer systems, and they rely on users' activities to validate transactions and require strong, secure mining algorithms to maintain its block chain. This research project presents an overview of cryptocurrencies and process automation for instant procurement using influencer's tweets. Tweets are culled from twitter and used to streamline the procurement process and predict its market volatility based on available data.

Keywords: Cryptocurrencies, instant procurement, process automation for instant procurement, algorithms

I. INTRODUCTION

The finance market is evolving and experiencing a shift in the 21st century as digital assets, as well as novel financial channels, instruments, and systems, are redefining financial transactions and paving the way for new capital channels [1]. Cryptocurrency is a kind of electronic money that can be exchanged online. It can only be accessed through computers or mobile phones. Block chain technology is what makes cryptocurrency possible. A block chain is a distributed ledger technology that organizes and records transactions between multiple computers. The security of this technology contributes to its appeal. Companies that use block chain to power their platforms have created their own currency, dubbed tokens [2].

Two major drawbacks of the traditional fiat (local) currency payment system are high transaction fees and a lengthy settlement period. People are looking for alternative currencies that allow for faster peer-to-peer (P2P) processing without the use of intermediaries as a result, resulting in a thriving market for digital currencies with lower settlement risk. There were many different types of digital currency before the advent of cryptocurrencies. A digital currency created by an institution and traded on a platform is the most common example. Loyalty points from businesses or digital coins generated by web-based platforms are examples of such currencies. Institutions or legal organizations oversee the production, transaction, accounting, and verification of digital currency [3].

All cryptocurrency systems operate in a peer-to-peer network, and digital currencies like bitcoin prodigiously arise energetically following its proposal from block chain. In the digital economy, it has the potential to become a major payment method as well as a competitor to existing money-transfer services. These cryptocurrencies service the entire world, rather than just one or a few nations [4].

Sentimental tweets are quite important in making choices and demonstrating mutual agreement. With the advent of online technology and its expansion, there is an enormous amount of data available on the internet for internet users, as well as a large amount of data being created [5]. To analyze Twitter data streams using a variety of machine learning techniques with use of Naive Bayes and Support Vector Machines. Twitter serves as both an online social networking site and a microblogging platform, allowing users to communicate via tweets, private messages, and retweets.

This research focuses on sentiment analysis of Twitter data in relation to cryptocurrencies, as well as machine learning-based automated systems for rapid digital currency purchase. This study looks at the data in tweets, which are very unstructured and diverse, and can be positive, negative, or even neutral in some situations, analyzes Twitter data streams using a variety of machine learning techniques with use of Naive Bayes and Support Vector Machines [5]. As the price increases, so also its volatility - users have experienced a substitutional effect in increase in demand for other cryptocurrencies.

II. LITERATURE REVIEW

Machine learning approaches have been applied in the multi-discipline research area as it has various applications to diverse fields including the trading in digital currencies. This research paper discusses sentiment analysis, which is the

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process of identifying and categorizing opinions to determine how individuals feel about something. Sentiment analysis is said to be a type of Natural Language Processing on many levels. It is divided into three categories: document level, sentence level, and phase level. The researchers also use Naive Bayes, maxEnt, and SVM (support vector machines) in this study. Positive and negative smileys are used to describe a person's attitude toward a particular topic. Several researchers proposed some of their methods in this research paper to produce more precise results in Sentiment Analysis.A research by [6] investigated whether incorporating cryptocurrencies into a traditional asset portfolio improves portfolio performance. Additionally, prior research in this area had concentrated exclusively on Bitcoin. For this study, the advantages of 18 cryptocurrencies were chosen based on their market capitalization.

A combination of lexicon and machine learning-based approaches for mining users' opinion on trading digital currencies was presented in [7]. First, sentiment analysis was performed at the entity level, which is a fine level of analysis. Second, sentiment analysis was divided into three categories: positive, negative, and neutral sentiment. As a result, lexicon-based approaches are used to identify positive and negative classes, while actual opinion is used to identify neutral classes.

A novel approach for analyzing sentiment on Twitter data was presented in [6]. To reveal the sentiment, the model extracted the opinion words (a combination of adjectives, verbs, and adverbs) from the tweets and the semantic orientation of adjectives was determined using a corpus-based method, and the semantic position of verbs and adverbs was determined using a dictionary-based method. The overall sentiment of tweets was then calculated using a linear equation that also considered emotion intensifiers. The prototype evaluated is a preliminary prototype, and the work is fact-finding in nature. The preliminary findings indicated that it is a motivating technique. Microblogging platforms are used by a variety of people to express their opinions on a variety of topics, making them an invaluable source of information. According to reviews of the literature, there are two approaches to spontaneously annotating sentiment at the word level: dictionary-based approaches and corpus-based approaches.
Prior to those research papers, [8] established automated procurement systems and evaluated supermarket performance. They both used a descriptive design to conduct their research. The supermarkets in Nairobi, Kenya, were the study's target population, with about 52 supermarkets in Nairobi. Because this is a small population, a census was conducted. To analyze the data, the researcher mostly used descriptive statistics. Tables of frequency distribution, mean, and standard deviation were included. Correlation and regression analysis were used to examine supermarket performance.

The optimal number of index constituents was found using a novel approach, proving that this index can track the crypto market. [9] built a crypto-currency market index, the CRIX. The CRIX was then compared to the market. The risk analysis revealed that the crypto market is much riskier than other markets, especially when viewed as a currency. It was also shown that the market outperformed Bitcoin, the most important crypto at the time. Finally, the forecasting comparison showed that social media data can forecast CRIX price movements.
The goal is to develop a method for analyzing sentiment scores using Twitter tweets. Twitter allows users to write up to 140 characters in length. Every day, more than a hundred million people use Twitter to share their thoughts. Analysis of public sentiments aids in the search of a response to a specific topic or factor. The goal of this paper is to provide a method for analyzing sentiment scores in droning Twitter feeds. This paper describes how to create a sentiment analysis that extracts tweets. The results divide user perceptions into positive and negative categories based on tweets. Second, they have a proclivity for debating various techniques for conducting sentiment analysis on Twitter data. This paper divides tweets into three categories: positive, negative, and neutral Twitter sentiment analysis, which falls under the heading of text and opinion mining. Sentiment analysis on Twitter falls under the category of text and opinion mining. To calculate the emotions of the tweets, this paper employs the Naive Bayes rule and the Python TextBlob package. They can easily understand the sentiment of the tweets with the help of Naive Bayes, which helps to create the result in probability with the help of graphical representation [10].
[11], also restrict access to scientific databases, so they proposed Timed-Chain, a block chain-based peer-review system that seamlessly integrates with publishers' existing databases. Publishers (of peer-reviewed journals/conferences), authors, and third parties (external editors/researchers/readers) can access the Timed-Chain securely and efficiently. Publishers oversee maintaining the block chain network by creating, verifying, and appending new blocks. This study introduces a novel mining incentive mechanism that operates in conjunction with the PoA. It assesses the efficacy of publishers' efforts to manage publications and develop new blocks. The publisher with the lowest value will create the next block. An incentive will be given to the "block's creator" node and added to its value to reduce the likelihood of it recreating the next block, resulting in fairness and system sustainability.

III. MATERIALS AND METHODS

Several approaches have been used by different researchers/individuals to effectively control the market volatility of cryptocurrency. The world's first exchange automated system was developed by a FinCEN-approved MSB (Money

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Services Business) in the United States. Allowing users to automate their cryptocurrency trading 24 hours a day, seven days a week without having to constantly check the markets.

It is one of the largest Binance brokers, combining liquidity from Binance and Huobi Global. [12]. Similar to Pionex, some teams developed crypto - hopper, a robot that allows one to conduct technical analysis on the cryptocurrency market. It was rated as one of the best crypto intelligence systems that have helped in managing all crypto exchange accounts in one place. The high-level model of this research is presented in Figure 1.

High-Level Model of the Proposed System

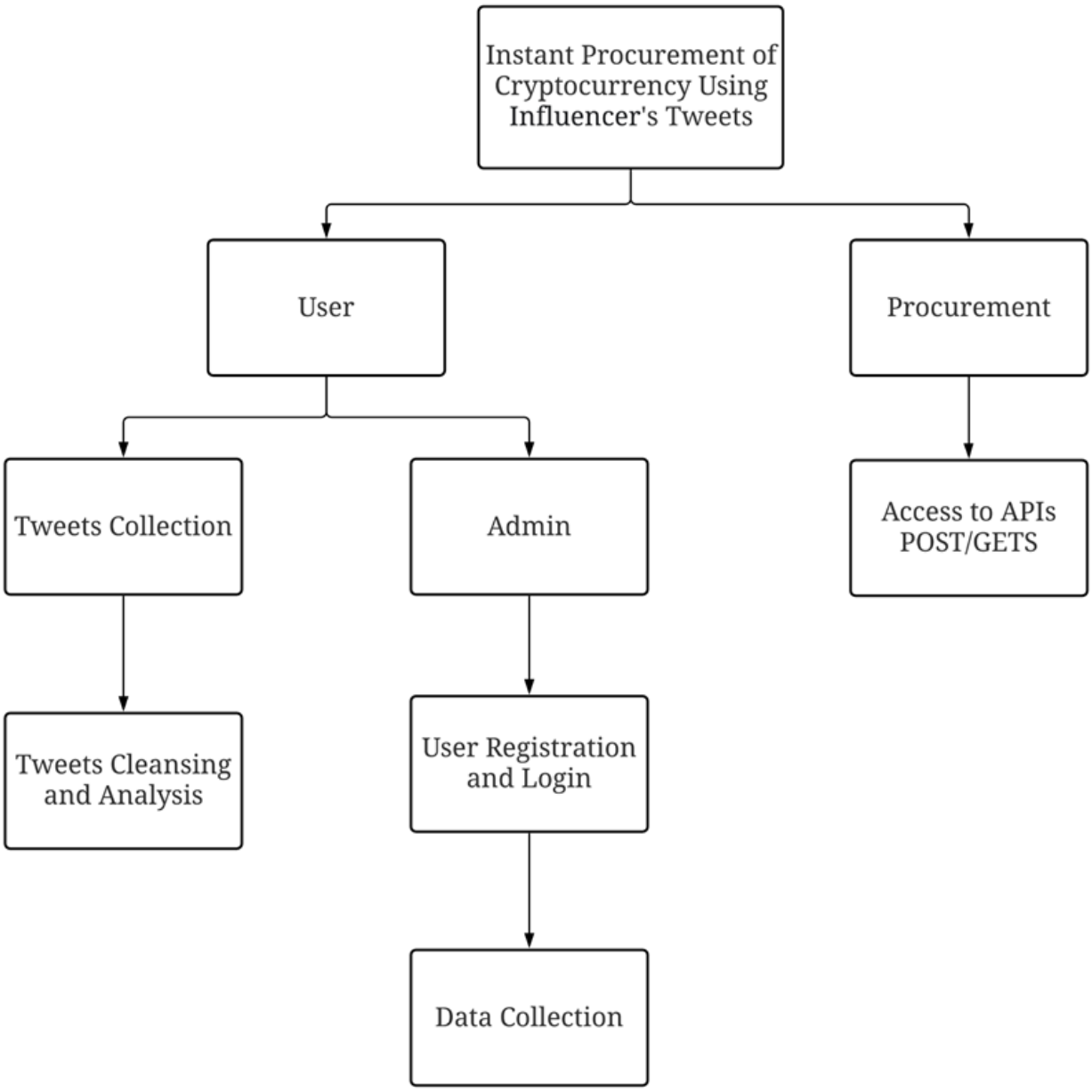

Figure 1: High-Level Model of the Proposed System

IV. METHODOLOGY

This research process adopted the Cross-Industry Standard Process for Data Mining (CRISP-DM). The project work will be developed using python programming language.

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A. Specification and Justification for the Selected Methodology

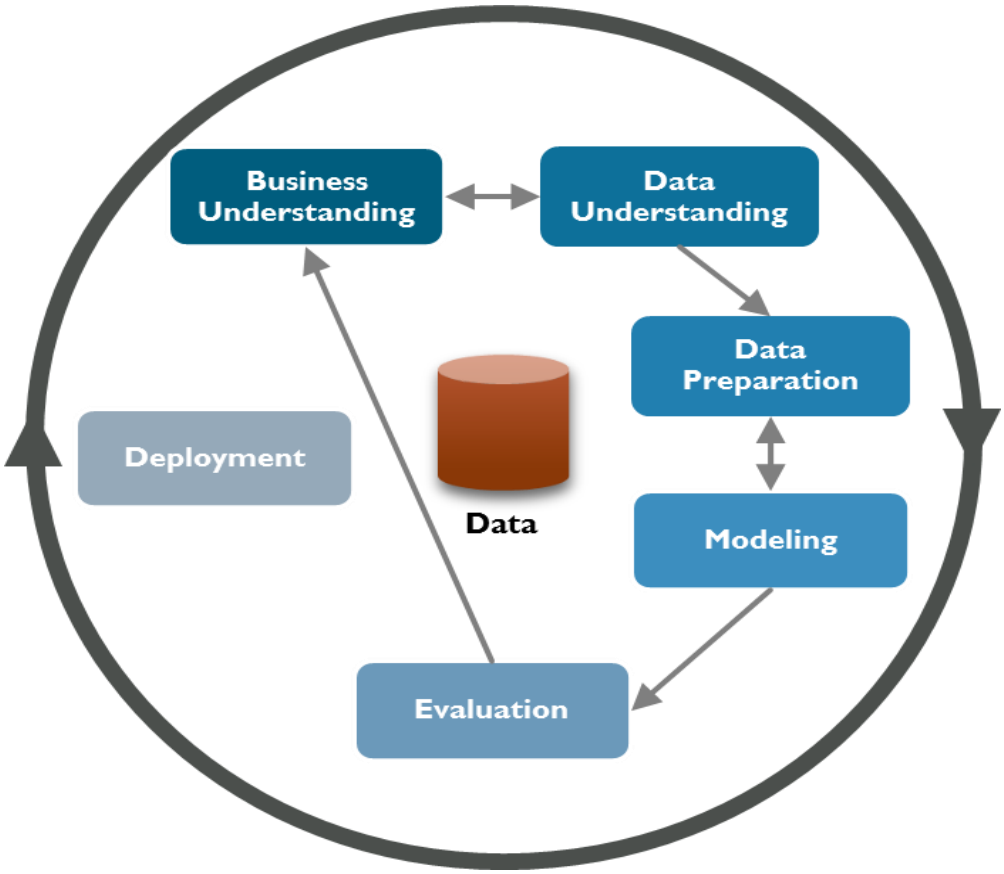

Figure 2: Cross-Industry Standard Process for Data Mining

Business Understanding: In this phase of this research work, we understand the merits of intelligent systems to automate the process of procuring cryptocurrency using influencer's tweets. Figure 3 depicts an overview of CRISP-DM tasks and their outputs.

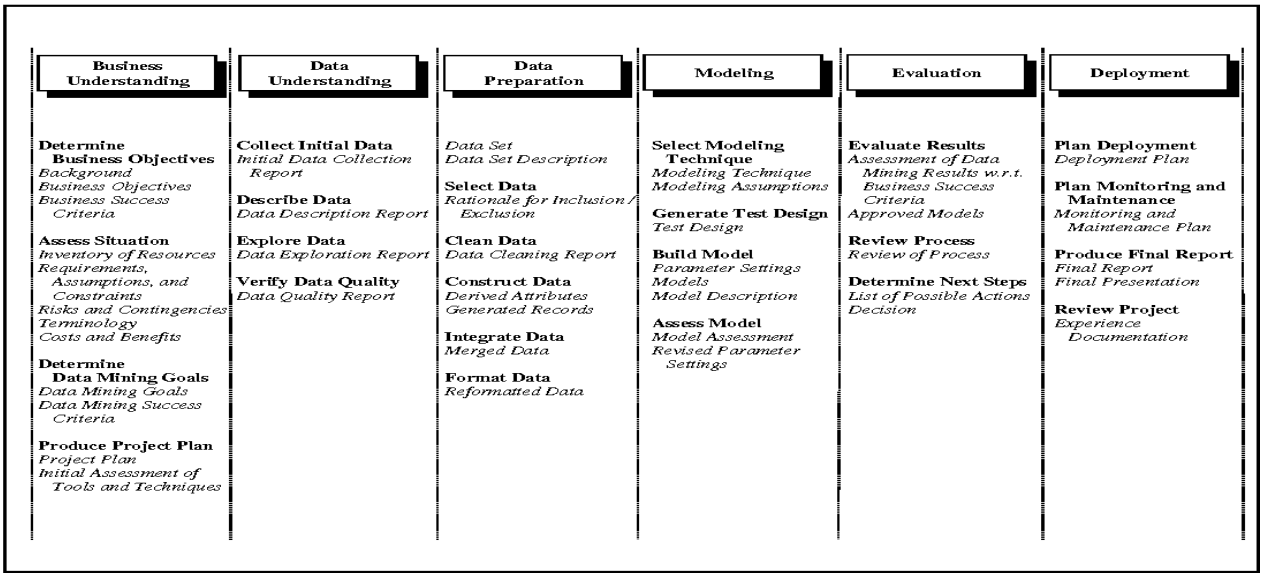

Figure 3: Overview of the CRISP-DM tasks and their outputs

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Data Understanding: The data understanding technique begins with data collection. This helps to gain a better understanding of data, identify data related tweets, gain initial insights and identify interesting subsets to form hypotheses for hidden information. The data used for this research work is obtained from Twitter in real-time.

Data Preparation: Since the generated data is raw and contains some outliers. In this phase, data cleaning technique is performed in real time and passed to the model. Steps in data preparation are likely repeated, and not in any particular order.

Modeling: In this phase, the generated data are classified into positive and negative tweets. Hence, sentimental analysis is conducted on the data.

Evaluation: The built models are being analyzed, in order to ensure that the model achieves the model business objectives. The model is thoroughly evaluated before final deployment and a decision made regarding the data mining results.

Deployment: Deployments of similar projects of this type are made independently accessible to the end users for deployment. The deployed model is not usually the end of the project. Usually, the knowledge gained is further considered for future implementation for researchers and end users. In this phase, we assess and interpret the mined pattern, rules, and reliability to the objective.

C. Implementation

I]. Input design:

This phase collects data via Twitter and the MetaTrader5 developer platform. Figure 4 is a screenshot of Twitter developer account registration; the generated tokens are used as inputs to process and access tweets from Twitter upon approval from the Twitter development team.

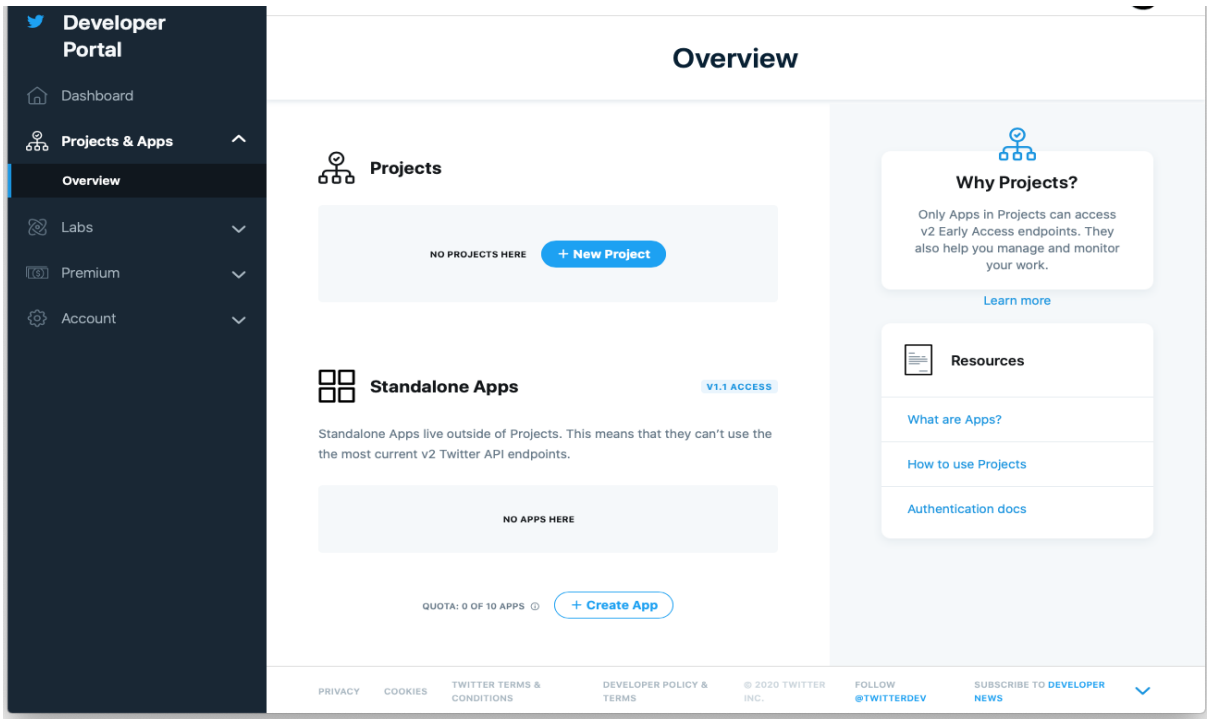

Figure 4: Twitter Developer Portal Registration

Figure 5 is a snippet of python code to generate tweets in real time. Mostly, the generated tokens are predefined with set rules and setting user preference is done by users. Outputs are generated in real time and passed to the procurement module as inputs to process the procurement.

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```
In [ ]: import tweepy

from tweepy import *
import pandas as pd
import csv
import re
import string

a=("Bw7OS0q0ScQPrWsGFArmFGC0D")
b=("iKbHrAb7gEzF10lu6rVXQMbPSeJbTypPvjp6tqHkTpbXbMPEmB")
c=("1329789156374040581-u4TonDnLyU54VJ9Bdw51LIvbEzhP06")
d=("TJNHO8uuIiL3aKRXyh8R5gR7fap26hnb3fetxyeUv0YiF")

consumer_key =a
consumer_secret =b
access_key=c
access_secret =d

auth = tweepy.OAuthHandler(consumer_key, consumer_secret)
auth.set_access_token(access_key, access_secret)
api = tweepy.API(auth,wait_on_rate_limit=True)


csvFile = open('cryptocurrency.csv', 'a')
csvWriter = csv.writer(csvFile)
with open('cryptocurrency.csv', 'r') as f:
    reader = csv.reader(f)
    for row in reader:
        print(row)


search_words = "#Bitcoin"      #enter your words
new_search = search_words + " -filter:retweets"
for tweet in tweepy.Cursor(api.search,q=new_search,count=100,
                           lang="en",
                           since_id=0).items():
    csvWriter.writerow([tweet.created_at, tweet.text.encode('utf-8'),tweet.user.screen_name.encode('utf-8'), tweet.u
```

Figure 5: Input to Generate "Bitcoin" related tweets from Twitter

II]. Output:

The output design describes the different formats in which the output of the system can be represented. The output of the system is the receipt of procurement when the tweets are positive. Sentiment analysis are conducted on the generated tweets to determine if it is positive, neutral or negative as shown in Figure 6.

```
                                since_id=0).items():
    csvWriter.writerow([tweet.created_at, tweet.text.encode('utf-8'),tweet.user.screen_name.encode('utf-8'), tweet.(

Streaming output truncated to the last 5000 lines.
['2021-08-09 12:06:33', "b'#BITCOIN to $100K this year'", "b'MarioLeb79'", "b'LaLaLand \\xf0\\x9f\\x93\\x8c'"]
['2021-08-09 12:06:32', "b'They were wrong again !!\\n\\xf0\\x9f\\x98\\x83\\xf0\\x9f\\x98\\x83\\xf0\\x9f\\x9a\\x
80\\n#Bitcoin https://t.co/3UkMm7kXLh'", "b'DecoyEscapee'", "b'Belgi\\xc3\\xab'"]
['2021-08-09 12:06:30', "b'Bitcoin 2.0 (BII) = Wealth Creation\\nBitBull = Freedom &amp; Liberty \\n\\n#eth #fin
tech #Bitcoin #Crypto #cryptocurrency\\xe2\\x80\\xa6 https://t.co/Qbzmbrr1vl'", "b'CryptoBeijing99'", "b'Decentr
alized'"]
['2021-08-09 12:06:26', "b'#Bitcoin price is going up, get \\xc2\\xa310 #free with use of a promotion code on ne
w #uk #luno accounts &amp; will be worth mo\\xe2\\x80\\xa6 https://t.co/X6BD1WnEM2'", "b'BitcoinPromoti2'",
"b''"]
['2021-08-09 12:06:23', "b'We buy #giftcards like\\n\\n#steam, \\n\\n#iTunes,\\n\\n#Vanilla, \\n\\n#AMEX ,etc
\\n\\nand #cryptocurrencies like \\n\\n#Bitcoin (#BTC),\\xe2\\x80\\xa6 https://t.co/azyah0E4Bu'", "b'MevineExcha
nge'", "b''"]
['2021-08-09 12:06:23', "b'#linkedin #shoppingstar #twitter #facebook #instagram #doge #socialmedia #pinterest #
dogecoin #deal #gift #gifts\\xe2\\x80\\xa6 https://t.co/FSPX3q5F81'", "b'brettmurphynet'", "b'Bay Area, CA'"]
['2021-08-09 12:06:22', "b'#tumblr #shoppingstar #twitter #facebook #instagram #dogecoin #socialmedia #pinterest
#doge #deal #gift #gifts\\xe2\\x80\\xa6 https://t.co/iqbthcvQ53'", "b'bmurphypointman'", "b'Bay Area, CA'"]
['2021-08-09 12:06:22', "b'Buy Crypto With Your Credit Card / Fast Crypto Exchange \\n\\nhttps://t.co/GwaCvQyQbc
\\n\\n#Bitcoin #BTC #ETH #XRP #Crypto\\xe2\\x80\\xa6 https://t.co/JwclIn0y3K'", "b'coinok'", "b''"]

In [ ]:
```

Figure 6: Output Generated "Bitcoin" related tweets

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III]. Algorithm of implemented application:

Step 1: Start

Step 2: If the user has both Twitter Developer and Metatrader5 account then go to step 4.

Step 3: Else:

3.1 User signup and apply for a Twitter developer account and MetaTrader5.

Step 4: Generate tokens.

Step 5: If the generated tweets are positive then go to step 7.

Step 6: Else

6.1: Fetch another tweet from the influencer then repeat step 5.

Step 7: System checks for possible coins and proceeds to procure.

Step 8: Save procurement transaction history.

Step 9: End.

V. RESULTS

A. Pseudo Code/Sequence of Micro Operation/Flowcharts

```
InstantProcurementSystem()
    Importing Python Libraries()
        get_twitter_token()
        consumer_key = get_consumer_key()
        consumer_secret = get_consumer_secret_key()
        access_key = get_access_key()
        access_secret = get_access_key_secret()

    sentiment_analysis()
        sentiment_key = get_sentiment_key()
```

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```
        SettingModelProcureCrypto()
            procure_bitcoin()
        PerformLogicCheck()
            IF SettingPreference() and tweet_sentiment > 0:
                RETURN PerformLogicCheck()
                    PRINT display_result
            ELSE:
                process_iterate()
        ProcurementModule()
            send_procure_request()
        IteratingTheProcess()
            process_iterate()
PRINT display_result
    ProcurementAccount()
        account_number = get_user_mt5_account
    SettingPreference()
    ScrappingInfluencerTweets()
        def get_elons_tweet():

    ConductingSentimentAnalysis()
        def analyze_sentence()
        PRINT display_result
    ConvertTweetJSON()
SAVE json_tweet = convert_raw_tweet()
```

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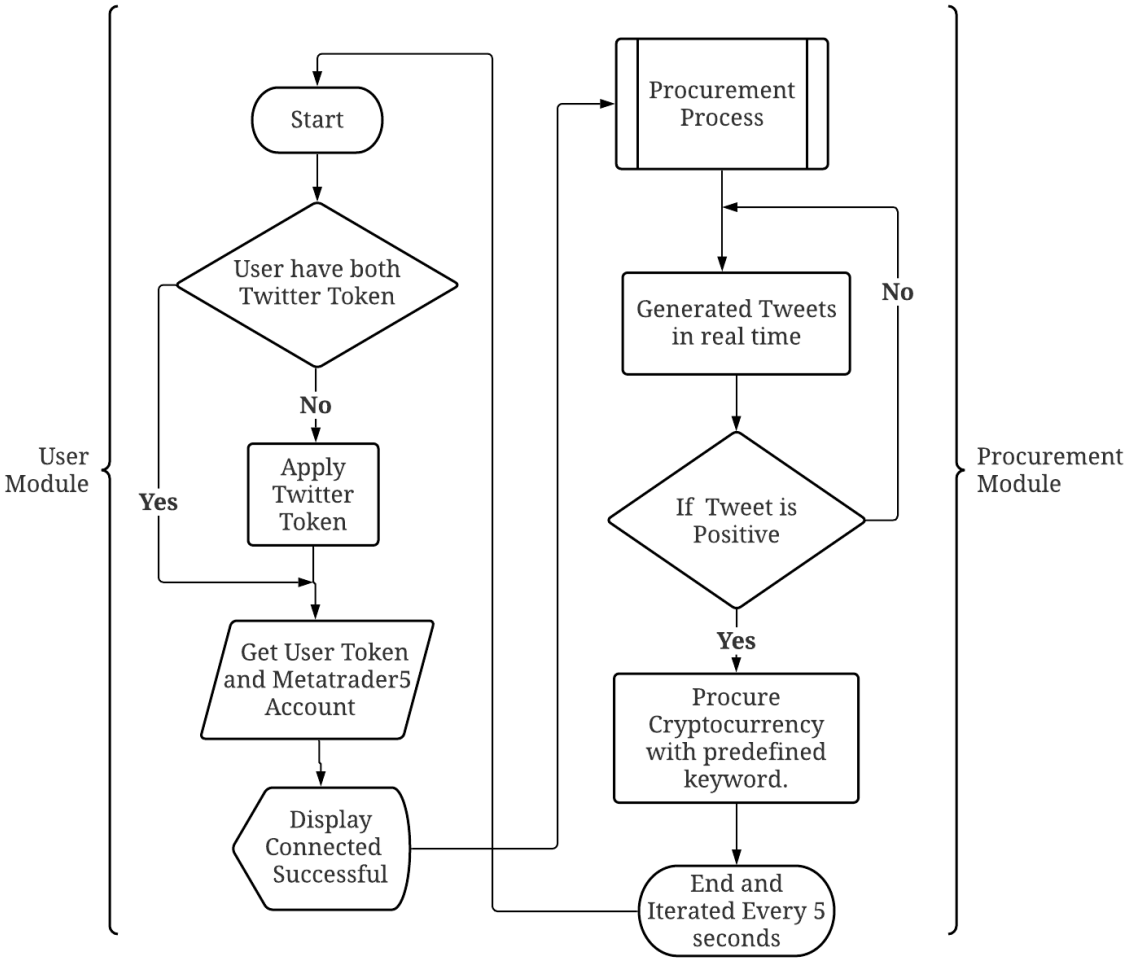

Figure 7: Flow Chart of the Procurement System

Data Understanding: Datasets needed for this research project are obtained in real-time from Twitter. Tweepy helps the system to cull tweets from Twitter, specifically tweets with these keywords ['Bitcoin', 'bitcoin', 'BITCOIN', 'btc', 'BTC', BTCUSD etc].

B. Development Process for the Procurement System

The development process of the procurement system started with the planning phase after an ardent traditional study of the current system, reviewing relevant documents and requirements gathering within the cryptocurrency domain.

This process is followed by the analysis phase where both the functional and non-functional requirements and feasibility study were analyzed. The system designing phase was not left out, as both the physical and logical design of the system was the outcome of the system designing phase.

The development process which is the implementation phase has to do with the writing of codes to perform the proposed functionality of the proposed system. The outcome of the testing phase practically shows how the logical and physical designs are translated into computer programs.

These outputs are validated and compared with the traditional method of procuring cryptocurrency in a real-life system. Whenever the output is negatively perceived, the development process takes a step back to the analysis phase; this is continued until a scale-able system is developed.

VI CONCLUSION

Everything in the financial world revolves around profit maximization and risk mitigation. To maximize profits and minimize losses, one must seek out a better alternative. The emergence of block chain technology has powered the use of cryptocurrency in the finance system.

However, the market price of these cryptocurrencies is highly volatile. As more individuals adopt the use of cryptocurrency as an investment and medium of exchange, its price increases. Hence, the market volatility also, quite a

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number of people conduct technical analyses to understand how the market trends work. Twitter plays a huge role during this analysis, as influencer tweets affect the market values.

Consequently, there arises the need to automate this process in order to maximize profits and minimize losses. In this work, the development of an instant procurement of cryptocurrency using influencer's tweets will help automate the process of conducting a manual technical analysis in the cryptocurrency markets.
In developing the procurement system, a survey of the already existing system was performed. A fully operational cryptocurrency procurement system was developed to automate the process of procurement using influencer's tweets. Also, sentiment analysis on data is mined to predict its future preference. Furthermore, an intelligent system for instant procurement of cryptocurrency was successfully developed. The features of this system include; web scraping of cryptocurrency-related data using Twitter, getting data from Twitter in real-time, authentication of user's data on the procurement platform, and procuring cryptocurrencies that have the greatest positive impact.

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