Crypto Currency Price Prediction System

Aditya Sule[1], Ashwani Tiwari[2], Rahul Yadav[3], Kirtida Naik[4]
[1, 2, 3, 4] Dept of Computer Engineering
[1, 2, 3, 4] VIVA Institute of Technology, Virar

Abstract- *This paper is based on system which will try to predict the cryptocurrency price using machine learning models.As we all know that crypto currency has become more popular now a days and many people are trying to find the best performing currency for getting good returns. So to help out this people we have created a system that will show the current performance of the currency and also will try to predict accurate result as much as possible by using machine learning algorithm.In this system there the data will be extracted from the online resources available. This data will be latest i.e current data. The data would be of past that means the data will be of certain period like past weeks or in months and by using this data the future prediction of currency will be done using model. The prediction will be in days or any certain period like days, weeks and also in the form of graph which will help in better understanding of how the desired currency will be performing. This system will help people who are willing to invest in crypto currency and make a right decision in which currency to invest.*

Keywords- Crypto currency ,machine learning ,prediction, accuracy.

I. INTRODUCTION

Crypto currency has been firstly introduced in 2009 which was a bitcoin. After that many crypto currency has been introduced in market and this soft currency which doesn't exist in hand notes form are becoming popular and been seen as a good resource of investment. Cryptocurrency is a digital currency in which all the transactions are done electronically. It is virtual currency which is decentralized, that without third party intervention all virtual currency users can get the services. However, services of this currency can make impact on international relations and trade because of its high volatility. There are several virtual currencies available in these days like ripple, Ethereum, bitcoin, Ethereum classic, doge coin, lite coin, etc.

The virtual currencies has an great acceptance by many different bodies like investors, researchers, traders, and policy makers. As this currency as also in turn proven to best investment resources There are many people around the world who are willing to invest their money in crypto currency and make good returns. But they are having fear of losing their money if they invest in wrong currency. So to help this people this system will predicts its best of the knowledge and will provide good percent accuracy. So that the people can invest their money rightly in any decent performing currency.

II. LITERATURESURVEY

It is a literature study of the research papers and research which gives the detailed information about some of the existing systems along with its advantages and disadvantages.

T.Awoke et al, [1] ,In this paper they have compared two different Deep learning models i.e LSTM and GRU which have been efficient for forecasting bitcoin prediction. LSTM was mainly designed to overcome the problem of remembering information. As in this LSTM it remembers information for long period of time. GRU is similar to LSTM as it is new version of RNN(recurrent neural network). GRU has basically two gates i.e reset gate in this it decides how much information that is past to be remembered. And another gate is update gate in this it decides the information that is to be throwed away and the updated information to be added. The process starts with the data preparation stage. As preparing data is the first crucial stage in machine learning. As dataset prepared can impact the accuracy of the model. The dataset consist of daily price value that is been extracted from online site known as kaggle . This dataset has seven different attributes they re as opening price, high prices price and closing price and also the market cap of publicly traded outstanding shares. The model was trained on the LSTM and GRU. To find the accuracy we measure it on RMSE (root mean square value) and MAPE(mean absolute percentage error). In this we observed that LSTM takes greater compilation time than GRU model and it was also clearly seen that GRU is converging faster and steady. Lastly it concluded that LSTM and GRU both are capable for long term dependencies. In this they have compared two basic Deep learning models. However it needs further investigation considering different parameter in addition to previous.

Mohammed Mudassir [2], The paper is related to prediction on crypto currency which is bitcoin as it is most popular crypto currency and also not having third party intervention of any country so there is no tax and any one

from any where from the world can invest in this currency. In his paper they have talked about prediction not only one time frame but multiply days like one, seventh, thirty, ninetieth day. For this they have used different machine learning models like SVM, ANN, SANN and LSTM . The process starts with data gathering, data cleaning, data scaling . In this the 80% data was assigned for training and 20% data was assigned for validation. After this they select certain features that will help in prediction. In this paper they observed that all the models used are satisfactory and having good performance with the classification models scoring 65% for next day and 62% to 64% for seventh-ninetieth day. The results shows that it is possible to forecast bitcoin price with low errors, while it is harder to predict the fall and rise.

Ho et al [3], In this paper they have tried to help people to invest their money in crypto currency as everybody wants to invest money at good place and want to see their money grown.to do this they have taken help of two models of machine learning that are Linear regression and LSTM. So the process starts with the data collection in this part of data collection the main objective is to gather the most significant ,rich in content and reliable data for statistical purpose. In this firstly we have to trim the data it is necessary because we want only those feature that can contribute to our prediction and remove those features which can create noise in our final output. To do this segregation they have used some predefined python libraries which help in identify important features for system. The model used in this system for prediction is LSTM an linear regression. linear regression is used to find the relation between the independent variable and dependent variable. This relationship helps in predicting future outcomes .In LSTM as it is better known for overcoming the vanishing gradient problem and can remember information for long period of time. By studying two models they found that LSTM has more accuracy then the linear regression. Hence this conclusion can differ by taking other parameters in consideration as crypto is more volatile and is affected by different parameters.

Lokesh Vaddi et al [4], In this paper, they have explaining several approaches for crypto currencies like Bitcoin price prediction were investigated. They compared the results accuracy of prediction with two machine Learning and deep Learning model 1) Linear Regression, Linear Regression with Features, Linear Regression consider the previous performance crypto currency data as input and analysis that data give the output and 2) Recurrent Neural Networks with LSTM cells. The research contribution of this technique is that we predicted a numerical value of price instead of performing binary classification, as well as used multiple features to train the model. The LSTM method performed notably better than the other approaches, and they believe that further research on using Neural Networks for time-series prediction is very promising to financial data analytics and other fields. LSTM model, as well as the autonomous agent-based on it, can be further enhanced with sentiment analysis. Historical sentiments from Twitter, the number of search queries from Wikipedia and Google, and other metrics reflecting the public interest in Bitcoin can be used to influence the weights during model training the final result accuracy of Linear Regression model is 69.9% and RNN (LSTM) model is 76.5% to 92.7% this model accuracy depending different data and factors

Karunya Rathan, [5], Crypto-currency like Bitcoin is additional widespread recently among investors within the projected work, it's studied to forecast the Bitcoin value exactly considering completely different parameters that influence the Bitcoin value. This study initial handles, it's known {the value| the worth| the value} trend on day by day changes within the Bitcoin value whereas it offers information regarding Bitcoin price trends. The dataset until current date is smitten open, high, low and shut value details of Bitcoin price. Exploiting the dataset machine learning module is introduced for prediction of value values. The aim of this work is to derive the accuracy of Bitcoin prediction victimisation completely different machine learning rule and compare their accuracy. Experiment results square measure compared for call tree and regression model.In this paper they select Bitcoin crypto. Bitcoin is a booming crypto-currency market, and various researches have been studied in fields of economics and price prediction. In they proposed work, Bitcoin dataset is considered from 2011 to till date price and applied machine learning models such as Decision Tree and Linear regression models. Also the price forecast for five days is done using Decision Tree and Linear regression models. The proposed learning method suggest the best algorithm to choose and adopt for crypto currency prediction problem. The experimental study results show that linear regression outperforms the other by high accuracy on price prediction.

Neha mangla , [6], In this paper, they tried to estimate the Bitcoin price precisely taking into consideration various parameters that affect the Bitcoin value.In our work, we pointed to understand and identify daily changes in the Bitcoin market while obtaining insight into most appropriate features surrounding Bitcoin price. We will predict the daily price change with highest possible accuracy. The market capitalization of publicly traded crypto currencies is currently above 230 billion dollars . These characteristics are outlined in the following subsection; the underlying details of Bitcoin, as they are described in depth in the cited papers. they considered previous Bitcoin transaction in which price and timestamps are the attributes used to predict the bitcoin price for future.

They used four methods for price predictions such as Logistic regression, Support vector machine, ARIMA and RNN. Prediction accuracies for these four methods are 47%,48%,53% and 56% .Among the four methods, ARIMA has performs well for next days predictions but performs poor for longer terms like given last few days price predict next 5-7 days prices. RNN perform consistently upto 6 days. Logistic regression-based model's assumptions were not violated, it is only able to classify accurately if a separable hyperplane exists

Thearasak Phaladisailoed [7], In this paper Bitcoin is a new currency that is recognized as a creative payment network. The operating system functions independently of a central structure or bank. Bitcoin is managed by the developed network. Bitcoin's open source code structure allows it to be uncontrolled and uncontrollable by an individual. The use of bitcoin requires virtual wallet. Verification of all payments is secured using public key encryption . Machine learning has also been employed directly for crypto currency price prediction For example, the creators in add to the Bitcoin determining writing by testing auto-backward incorporated moving normal (ARIMA) and neural organization auto-relapse (NNAR) models to figure the day by day value development dependent on the authentic value focuses. Also the creator in presents a Neural Network system to give a profound AI answer for the digital currency value expectation issue. The system is acknowledged in three moments with a Multi-layer Perceptron (MLP), a basic Recurrent Neural Network (RNN) and a Long Short Term Memory (LSTM), which can learn long conditions. Conversely, our forecast model as well as considering the web-based media impact, additionally utilizes web based figuring out how to ceaselessly gain from its errors and work on itself simultaneously.

Jifeng Sun, [8], In this paper There are two of the most common metrics used to measure accuracy for continuous variables, Mean Squared Error (MSE) and R-Square (R2). The MSE and R2 of all our implemented models while table 2 shows the calculated time of all our implemented models. The results show that deep learning based regression models: GRU and LSTM give the better result than Theil-Sen regression and Huber regression. GRU give the best results of MSE at 0.00002 and R2 at 0.992 or 99.2%. Whereas, the calculated time that Huber regression use is much less than LSTM and GRU. Therefore, this research aims to discover the most efficient and highest accuracy model to predict Bitcoin's prices from various machine learning algorithms. By using 1-hour interval exchange rate in USD from January 1, 2012 to January 8, 2018 via the Kaggle website, some different regression models with scikit-learn and Keras libraries had experimented. This research uses two libraries; scikit-learn and Keras for analyzing data in order to create machine learning models.

Shubhankar Mohapatra [9], In this paper we give a clever constant and versatile cryptographic money value expectation stage dependent on Twitter feelings. The integrative and secluded stage adapts to the three previously mentioned difficulties in more than one way. Right off the bat, it gives a Spark-based engineering which handles the huge volume of approaching information in a steady and shortcoming lenient way. Besides, the proposed stage offers a methodology that upholds feeling examination dependent on VADER which can react to a lot of normal language handling inquiries progressively. Thirdly, the stage upholds a prescient methodology dependent on web based learning in which an AI model adjusts its loads to adapt to new costs and opinions. At long last, the stage is particular and integrative as in it consolidates these various answers for give novel realtime apparatus backing to bitcoin value expectation that is more adaptable, information rich, and proactive, and can assist with speeding up dynamic, reveal new freedoms and give more 978-1-7281-0858-2/19/$31.00 .A digital money is an advanced cash intended to fill in as a mechanism of trade that utilizes solid cryptography to get monetary exchanges, control the formation of extra units, and confirm the exchange of resources. They depend on decentralized frameworks based on block-chain innovation, an appropriated record implemented by a unique organization of PCs . The originally decentralized digital currency, Bitcoin, was delivered as open-source programming in 2009. After this delivery, roughly 4000 altcoins (other digital currencies) have been delivered. As of August 2019, the complete market capitalization of digital currencies is $258 billion, where Bitcoin alone has a market capitalization of $179 billion.

Lekala Sreenath Reddy [10], In this paper analyses the price accuracy by taking differrent parameters in consideration and gathering information from different reference paper and applying in real time gathering data from various reference papers and applying progressively ,they tracked down the benefits and burdens of bitcoin cost forecast. Every single paper has its own arrangement of approaches of bitcoin cost expectation. Many papers has exact cost yet some other don't, however the time intricacy is higher in those expectations, so to lessen the time intricacy here in this paper they utilize a calculation connected to AI named LASSO(least absolute shrinkage selection operator. The other papers used different algorithms like SVM(support Vector Machine) ,coinmarkupcap, Quandl, GLM, CNN(Convolutional Neural Networks)and RNN(Recurrent Neural Network) and so on which don't live it up administration, yet in LASSO finding of the outcomes from a bigger information base is speedy and

fast..so for this reason we draw a correlation between different calculations and the LASSO calculation, this overview paper assists the impending specialists with having an effect in the their papers. By preprocessing the dataset, they apply the a few information mining methods to reduce the noise of information.

Nor Azizah Hitam [11], This paper makes a comparative study of Machine Learning algorithms for cryptocurrency forecasting.Machine Learning is essential for Artificial Intelligence that can make future forecastings based on the previous experience. In this paper techniques has been proposed to develop models including AI calculations like Neural Networks (NN), Support Vector Machines (SVM) and Deep Learning.SVM has several advantages over the other models in forecasting,SVM gives an outcome that is nearly or near genuine outcome yet additionally It ha to improve the accuracy of the result itself. However, recent research has showed that due to small range of samples and data manipulation by inadequate evidence and professional analyzers, overall status and accuracy percent of the forecasting needs to be improved in future studies as well. Though research on accuracy percent has yet to be done.

Neha Mangla [12], In this paper, here they tried to estimate the crypto currency price precisely taking into consideration various parameters that affect the Bitcoin value. Crypto uses a peer-to-peer technology to operate with no central authority or banks. Bitcoin is open-source, its design is public, nobody owns or controls and own can take a part. Crypto value varies just like any other stock. There are many algorithms and techniques used on stock market data for price forecast daily changes and analysis. they try pointed to understand and identify daily changes in the Bitcoin market while obtaining insight into most appropriate features surrounding Bitcoin price. they will try predict the daily price change. The market capitalization of publicly traded cryptocurrencies is currently above $250 billion. Bitcoin, the most valuable cryptocurrency, serves primarily as a digital store of value, and its price predictability has been well-studied. In this paper they are described the depth of cryptocurrency.

Saad Ali Alahmari [13], In this Research paper, they have explained the forecasting and prediction of cryptocurrency. they using different kernels of a “Support Vector Regression” (SVR) model. Many researchers have tried forecasting the price of cryptocurrencies using a number of “machine learning” algorithms. Most of the studies were mainly performed in statistical analysis and a limited number of non-linear and linear algorithms. Few researchers have experimented with the SVR model. In this research, experimented with the SVR algorithm in a bivariate time series model in which crypto-currencies (daily-Closed Price) and the MSCI World Indexes (daily-Closed Price) are continuous. And collected a dataset of three cryptocurrencies (“Bitcoin, XRP, and Ethereum”) with the highest market capitalization values relative to the MSCI-WI Wide Index and they study.

[14], In regression method we are given some data and the job is to train our computer using the data provided to get close to actual result. Unsupervised learning allows users to perform much more complex the supervised learning. This model discover patterns on it own and even out previously undiscovered information. Comparative study is process of demonstrate ability to examine, compare and contrast one as more subject. The algorithm are proving from time to time with the advent of new tools and methods. So in this paper the major contribution to give details discuss about each and every algorithm used in this analysis.

In regression method we are given some data and the job is to train our computer using the data provided to get close to actual result. Unsupervised learning allows users to perform much more complex the supervised learning. This model discover patterns on it own and even out previously undiscovered information. Comparative study is process of demonstrate ability to examine, compare and contrast one as more subject. The algorithm are proving from time to time with the advent of new tools and methods. So in this paper the major contribution to give details discuss about each and every algorithm used in this analysis.

[15], Bitcoin is a not old technology and hence only very less price prediction model available deal with series data and have created three time data set . Then they preform random forest Classifiers on their datasets to produce three model. RNN model with LSTM is evidently effective for forecasting and prediction of bit coins prices the linear regression model because of its capability to recognize longer term dependencies.

III. PROPOSED SYSTEM

The system main purpose is to predict the price of crypto currency as accurate as possible. The system has an user friendly interface designed which consists of live price which helps any new person to analyse the market status of cryptocurrency. The user has to do only simple steps like firstly you have to select the ML model you want to use for prediction as we will suggest to use LSTM as it get a good percent of accuracy after selecting the algorithm you have to select the date from which date till which date the dataset to be

extracted as on the basis of dataset the prediction is done next step is the last step in this you have to select the cryptocurrency name in which you are interested or want to predict the price for. We will recommend you to see the live price show in the initial part of system as the cryptocurrency is a volatile field as every crypto currency price keeps on fluctuating the price shown is live this will give an idea that which cryptocurrency prediction is to be done. After performing all the steps you will be getting the prediction of cryptocurrency you choosed for and the ML aloorithm which is opted for prediction the result will be in graph so that any non technical person can also get an idea of will cryptocurrency will be performing well and to which cryptocurrency to be invested in.

IV. METHODOLOGY

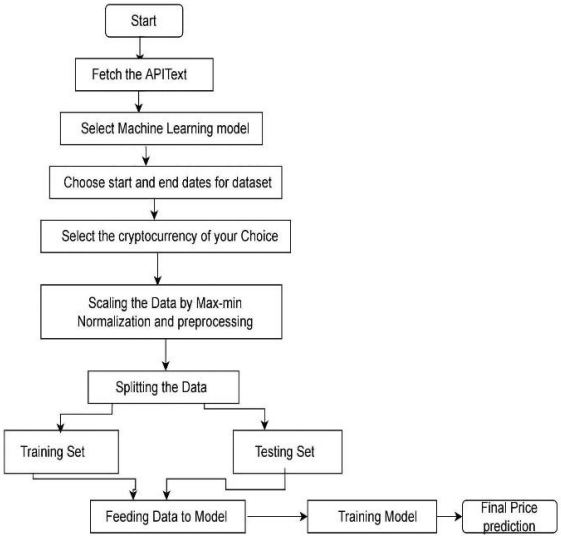

Fig 1: System Diagram of Cryptocurrency Price Prediction

The first step in any machine learning system is to gather data. The data gather must be rich in content and should be latest. After that the data gets set in certain frame. That is the data is to be trimmed and we have to take out the necessary data that is needed for us. This trimming of data is the crucial part of any system. As the accuracy of the system can be dependent on this part. The trim data should be of our need. It should not contain anything which we don't want as having useless data can make it more complex. The trim should be in a specific pattern needed. As the data we get is in the raw form in the initial stage. After pre-processing it we get the beneficial data. The data is then feeded to the system The data is then feeded to the system. This data is split into training and testing set . After feeding data to the system different models are been fit in this system. The model having more accuracy is selected. This accuracy is calculated and derived by using the testing data sets. Generally more data is given for training and the remaining data is given for testing. The prediction can be shown in many forms like in dotted graph, bar graph or line graph. The graph shows the actual results and it also shows the predicted result done by system.

V. RESULTS

1.Live Chart of Crypto currency price:

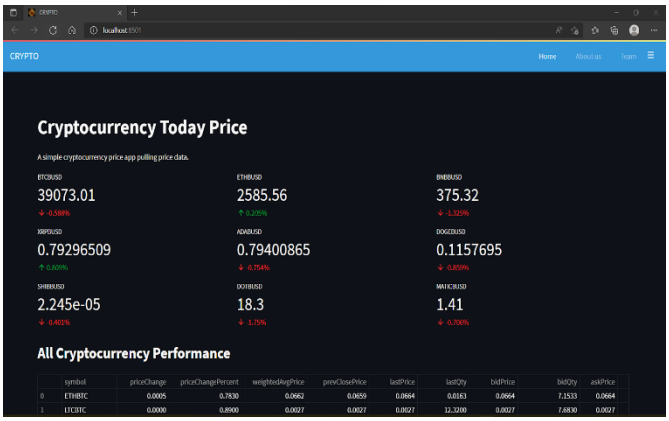

Fig 1: Live Chart of Crypto currency price

When you first visit the system will be seeing a values in point which keeps on fluctuating this values are nothing but the live price of cryptocurrency which keeps changing .It is basically for people who don't have an idea of how the crypto market is performing in current time.

2. Select ML model

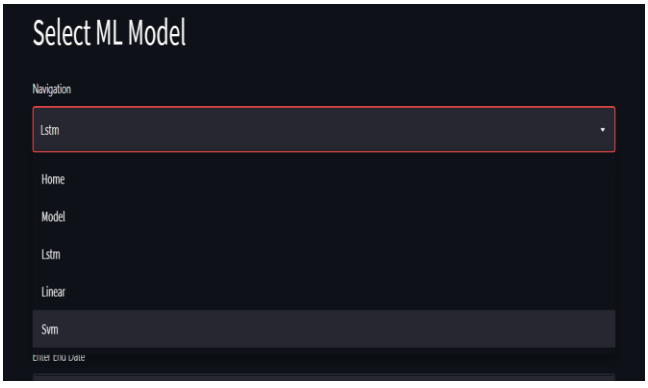

Fig 2: Select ML model

Here you will be seeing the different ML models so here user have to choose the ML algorithm of their choice to do the prediction as we will recommend LSTM model as this give an good percent of accuracy but user can choose model of their choice.

3.Set dates for dataset

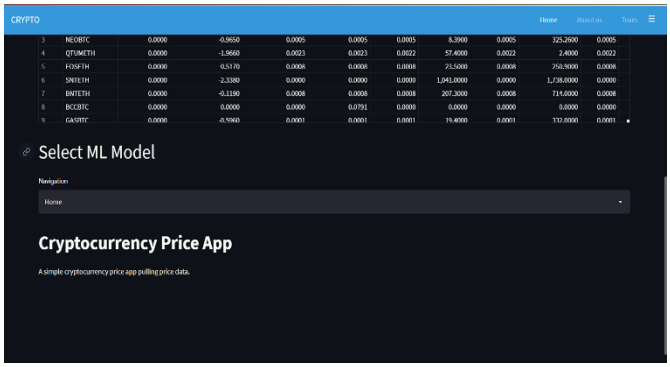

Fig 3: Set dates for dataset

After selecting the ML model to do the predicting next part is to set the dates from which till which date the data should be extracted. As using that data the prediction would be done this data is of past data from which the ML model learns and gives us the prediction.

4. Choose the name of Crypto currency

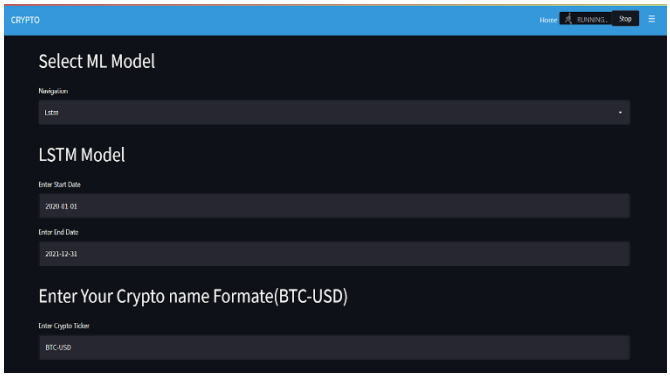

Fig 4: Choose the name of Crypto currency

When you have set the dates the next step is to choose the cryptocurrency for which the user want to do the prediction .If the user is not aware of the current price of cryptocurrency they can refer to the initial part of the system where there is live price of cryptocurrency by seeing this using can analyse and can make a decision to which crypto currency the prediction to be done.

5. Model Learning

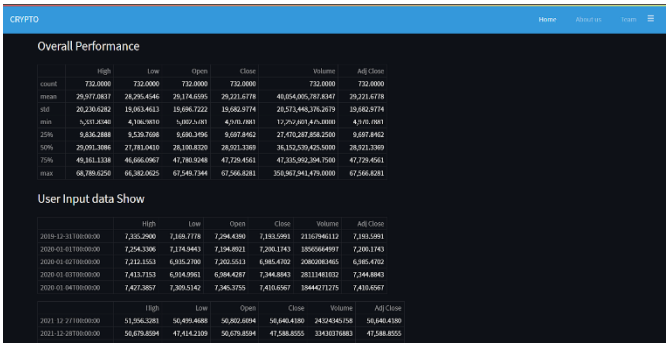

Fig 5: Model Learning

This are the dataset which is been analysed by ML model from the set dates that the user have selected/set.

6. Prediction values

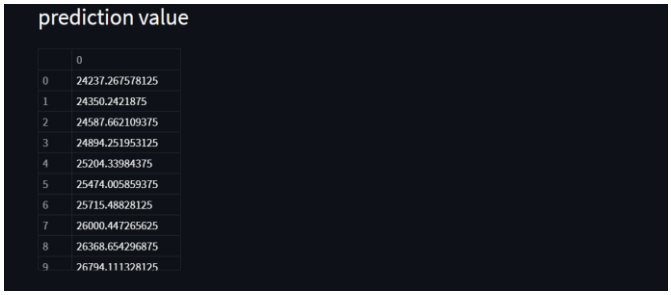

Fig 6: Prediction values

This are the prediction values that system has given us by analysis the data set using the ML model of user's choice.

6. Final Prediction in Graph

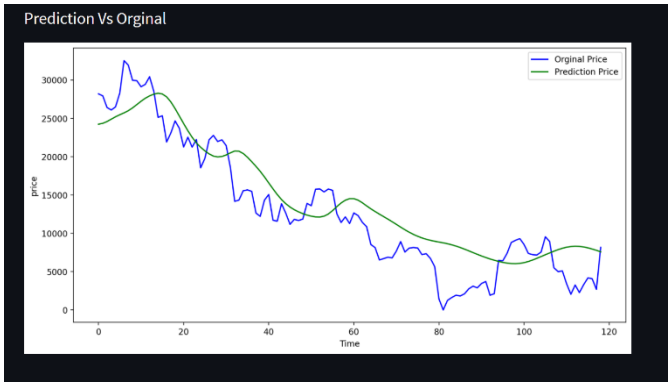

Fig 6: Final Prediction in Graph

Here the graph is been plotted, the green line represents actual price and the red line represents the predicted price. Graph is been plotted for better understanding.

VI. CONCLUSION

The proposed system will be able to predict the future price of the crypto currency.The accuracy will also be of good percent.This prediction in turn will help people who fear to invest in crypto currency and will help them to make a good outcomes and to make a right choice.The proposed system is capable to do prediction of cryptocurrency price by using machine learning algorithm. The system will be usefull for person interested in investing in crypto market. So to use this system the person do not need a prior knowledge of what the current price of cryptocurrency is because we have displayed the live chart of crypto currency this will help the non-technical person to know about the cryptocurrency which is performing well in current time . Our system is mainly focused on LSTM model as we have also kept other models for user convinence. As we know that every algorithms has it pros and cons so we have kept this choice of selecting the model to users end so that user can themselves make a comparison between the different algorithms that which algorithm has good percent of accuracy. While making this project we concluded that every steps from taking data set size till the selecting the model every steps plays an important role in predicting accurate price.As the main goal of our system is to give user a good percent of accuracy and make users investment goes in right direction.

REFERENCES

[1] T.Awoke et al,"Bitcoin Price Prediction and Analysis Using Deep Learning Models", researchgate, October 2020.

[2] Mohammed Mudassir ,"Time-series forecasting of Bitcoin prices using high-dimensional features: a machine learning approach",springer,04 July 2020.

[3] Ho et al, "Bitcoin Price Prediction Using Machine Learning and Artificial Neural Network", INDJST, September 2021.

[4] Lokesh Vaddi et al.," Predicting Crypto Currency Prices Using Machine Learning and Deep Learning Techniques", IJATCSE, july -August 2020.

[5] Karunya Rathan,"Crypto-Currency price prediction using Decision Tree and Regression techniques", IEEE 2019.

[6] Neha mangla, "Bitcoin Price Prediction Using Machine Learning ",Researchgate ,May 2019.

[7] Thearasak Phaladisailoed , "Machine Learning Models Comparison for Bitcoin Price Prediction ", IEEE 2018.

[8] Jifeng Sun, " Using machine learning for cryptocurrency trading ",IEEE 2019.

[9] Shubhankar Mohapatra ," KryptoOracle: A Real-Time Cryptocurrency Price Prediction Platform Using Twitter Sentiments" , IEEE 2019.

[10] Lekala Sreekanth Reddy, "A Research On Bitcoin Price Prediction Usingachine Learning Algorithm ", IJSTR ,April 2020.

[11] Nor Azizah Hotam, "Comparative Performance of Machine Learning AlgorithmsFor Cryptocurrency Forecasting", ResearchGate, September 2018.

[12] Neha Mangla , "Bitcoin Price Prediction using Machine Learning " ,International Journal of Information and Computing Science , May 2019.

[13] Saad Ali Alahmari , " Predicting the Price of Cryptocurrency using Support Vector Regression Methods", ResearchGate, April 2020.

[14] Rishiraj Roy, "A Comparative Study of Different Machine Learning Algorithms on Bitcoin Value Prediction", IEEE, 2018.

[15] Kavitha H, "Performance Evaluation of Machine Learning Algorithms for Bitcoin Price Prediction", IEEE, 2020.