



**Proposal
For
Year Project
Bachelor of Science in Information Technology**

Amazon Stock Price Prediction

Submitted by

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1. Please do not alter the layout of the application form. Information must be filled in the spaces provided, under set format.
2. Guidance notes in various fields should not be deleted.
3. Required information should be duly filled in the specified fields.

Guidelines and Forms

Submission Procedure

Duly filled proposal forms completed in all respects should be submitted in form of soft copy in the VLE. On receipt of the applications the proposals will be evaluated by the examiner and proposal would then be defended by student groups. The project group may need to revise the proposal in light of the examiner's recommendations.

For further information, please contact:

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Application for the Project

1. Project Identification

1.1 Reference Number:

2022_ITS307_06(Year_Module_groupNo)

(for office use only)

1.2 Problem statement

The most significant dangers of investing in Amazon.com, Inc. (NASDAQ: AMZN) stock include rising competition, unknown profit potential, unpredictable revenue growth, speculative valuation, and share price volatility. Because of this, there are no guarantees of profits when the stock is brought, which makes stock one of the most risky investments. Price volatility may be the one danger that prevents most would-be investors from investing. Price variations impact the prices of securities, commodities, and investment fund shares.

The benefit of predicting the stock market is it will aid to invest wisely. Investors will be able to make more money if they can accurately forecast share price movement. The investors or online traders will be allowed to get peek into the reasons behind a certain market trend and understand price behavior. It will also diminish possible risks that are in online trading and enables the investor to make accurate decisions.

1.3 Project Title:

Amazon Stock Price Prediction

1.4 Key Words:

1. Amazon
2. Stock Market
3. Machine Learning
4. Prediction
5. Regression

2. Aims, Goals, Objectives and scope of the Project

2.1 Aims of the Project:

To analyze the Amazon stock prices and make pertinent predictions to anticipate how the Amazon stock value of a financial exchange will move in the future.

2.2 Goals of the Project:

To apply data analysis and Machine Learning techniques to study Amazon stock prices.

2.3 Objectives of the Project:

1. To generate the pattern from a large set of data of the Amazon stock market for the prediction.
2. To forecast an approximate value of share price of Amazon.
3. To provide analysis and prediction for the users through a dashboard.

2.4 Scope of the Project:

The analysis and prediction of Amazon stock price for the current investors and future interested investors around the world.

3 Project features

3.1 Background

(Explains why you are doing the project. It provides a brief overview of the background to the project and establishes a particular area, or problem, that needs to be investigated further. It provides a clear statement of the topic of the proposed work.)

The stocks which are also known as equities have existed for centuries and it is a way of representing ownership in a company. The Belgium stock exchange back in the year of 1531 is the oldest stock exchange in history. It is known that the brokers and moneylenders used to meet there to make business deals but at the time the use of actual stocks were not used instead they traded in promissory notes and bonds.

Stock Market prediction and analysis is the act of trying to determine the future value of a company stock or other financial instrument traded on an exchange and it is now expanding with the availability of new data sources, markets, financial instruments, and algorithms. Stock market is an important part of the economy of the country as it plays a major role in the growth of the commerce industry as it organizes the resources and channels them to useful investments. This eventually affects the economy of the country.

The Efficient Market Hypothesis (EMH) states that in an efficient market, stock market prices fully reflect available information about the market and its constituents and thus any opportunity of earning excess profit ceases to exist. For the majority of the companies, the stock market acts as a primary source to raise funds for the expansions of the business. Therefore both investors and the industry are involved in the stock market and always determined to verify whether some stock will rise or fall over a certain period of time. The stock market is basically based on the concept of demand and supply where if the demand for a company's stock is higher, then the company share price increases and if the demand for company's stock is low then the company share decreases.

Amazon.com, Inc. is an American multinational technology company which focuses on e-commerce, cloud computing, digital streaming, and artificial intelligence. It has been referred to as "one of the most influential economic and cultural forces in the world", and is one of the world's most valuable brands. It is one of the Big Five American information technology companies,

alongside Google, Apple, Meta, and Microsoft. Amazon(AMZN) has a good stock price history and as of now its revenue mounts up to 232.9 billion USD which becomes more of the reason to know the future value of it. Stock market is very vast and difficult to understand and is considered too uncertain to be predictable due to huge fluctuation of the mark. Data analytics and Machine learning plays a vital role in the prediction of the stock prices in today's world which has helped multiple investors and industries. The project is intended to solve the economic dilemma created in individuals that want to invest in Amazon.

3.2 Literature Review:

(Detailed review of what all has been done internationally in the proposed area quoting references and bibliography. This section demonstrates the evolution of Technology, the depth of the project team literature search and builds the confidence of the evaluators about capability of the team in achieving the stated objectives.)

Stock market forecasting is a tough and risky venture. Knowledgeable investors having a strong financial background based their predictions on fundamental analysis, technical analysis or both. However the people with no knowledge of finance rely mostly on market suggestions provided by specialists when making stock market predictions through investing. Two most common methods of predicting stock prices are fundamental analysis. While fundamental analysis looks into a company's data such as cash flow, return of assets and history of profits that might directly influence the value and price of a stock, technical analysis uses statistical tools, charts, etc. and also takes into consideration the historical stock price movement patterns. (James, 2009). The prediction for the stock market varies from one investor to another, whether he or she is looking for long-term investment or short-term window. Due to this notion, stock market prediction would be established on traditional investment or trading/speculation.

Akash Doshi and others (2020) did a project where they tried to predict stock prices by using the Long Short Term Memory (LSTM) neural networks and Autoregressive Integrated Moving Average (ARIMA). For the project, the dataset of four different companies were used. The design of a trading strategy that performs portfolio optimization was taken into consideration during the

project. Then the loss function was customized to train the LSTM to increase the profit earned. Stock price predictions on the majority of the data showed a comparable accuracy by both ARIMA and LSTM. A portfolio optimization bot using convex optimization techniques was developed.

Chavan and Patil (2013) contribute to our understanding of ANN stock market prediction by surveying different model input parameters found in nine published articles. They attempt to find the most important input parameters that produce better model prediction accuracy. Based on their survey, they find that most ML techniques make use of technical variables instead of fundamental variables for a particular stock price prediction, while microeconomic variables are mostly used to predict stock market index values. In addition, hybridized parameters produce better results when compared with the use of only a single input variable type.

Kranthi Sai (2018) studied a machine learning technique called Support Vector Machine (SVM) to predict stock prices for the large and small capitalizations and in the three different markets, employment prices with both daily and up-to-the-minute frequencies. In this project four features are used to predict stock price direction such as price volatility, price momentum, sector volatility, and sector momentum. SVM algorithm works on the large dataset value which is collected from different global financial markets and also it does not give a problem of overfitting. Various machine learning based models are proposed for predicting the daily trend of Market stocks. Numerical results suggest high efficiency.

3.3 Requirements

The requirement that the system needs has been categorized into two as follows:

3.3.1 Functional Requirements

The system should be able to generate approximate share prices of Amazon.

3.3.2 Non-Functional Requirements

- Accuracy : The system should be able to provide high accuracy.
- Efficiency : The system should be efficient by being able to perform in a short amount of time.
- User-friendly : The UI of the system should be simple so that it is very easy for the users to use.

3.4 Technology

1. Python
2. Google Colab
3. Heroku
4. Machine Learning Algorithms(Regression)

3.5 System Architecture

3.5.1 System Design

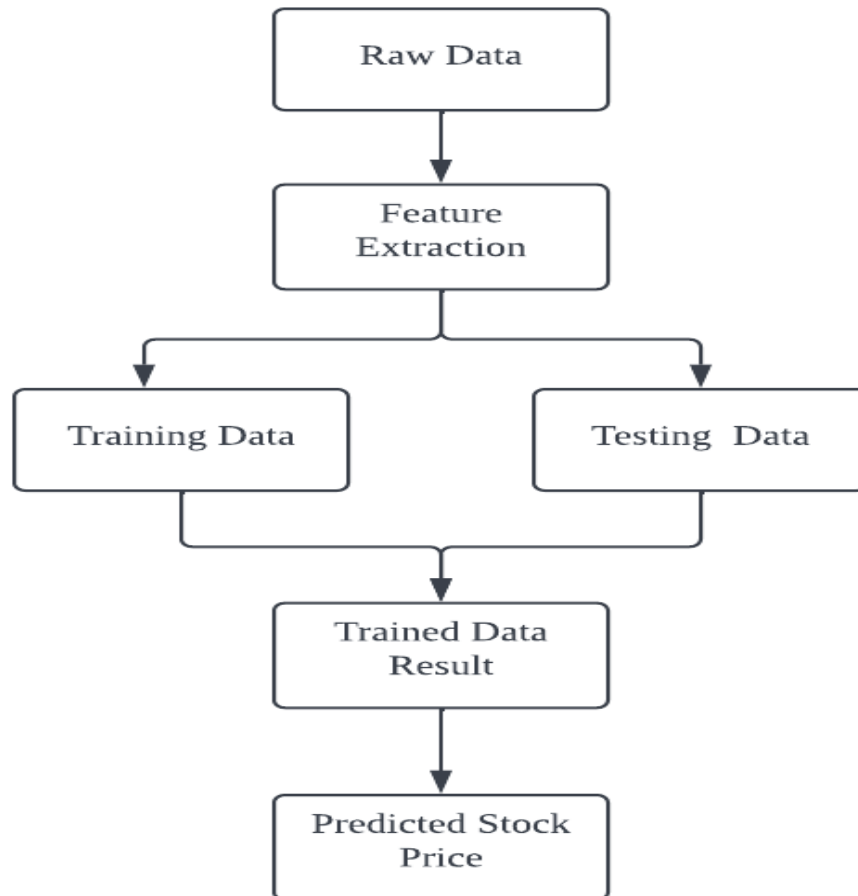


Figure 1.1: System Design

3.5.2 Workflow

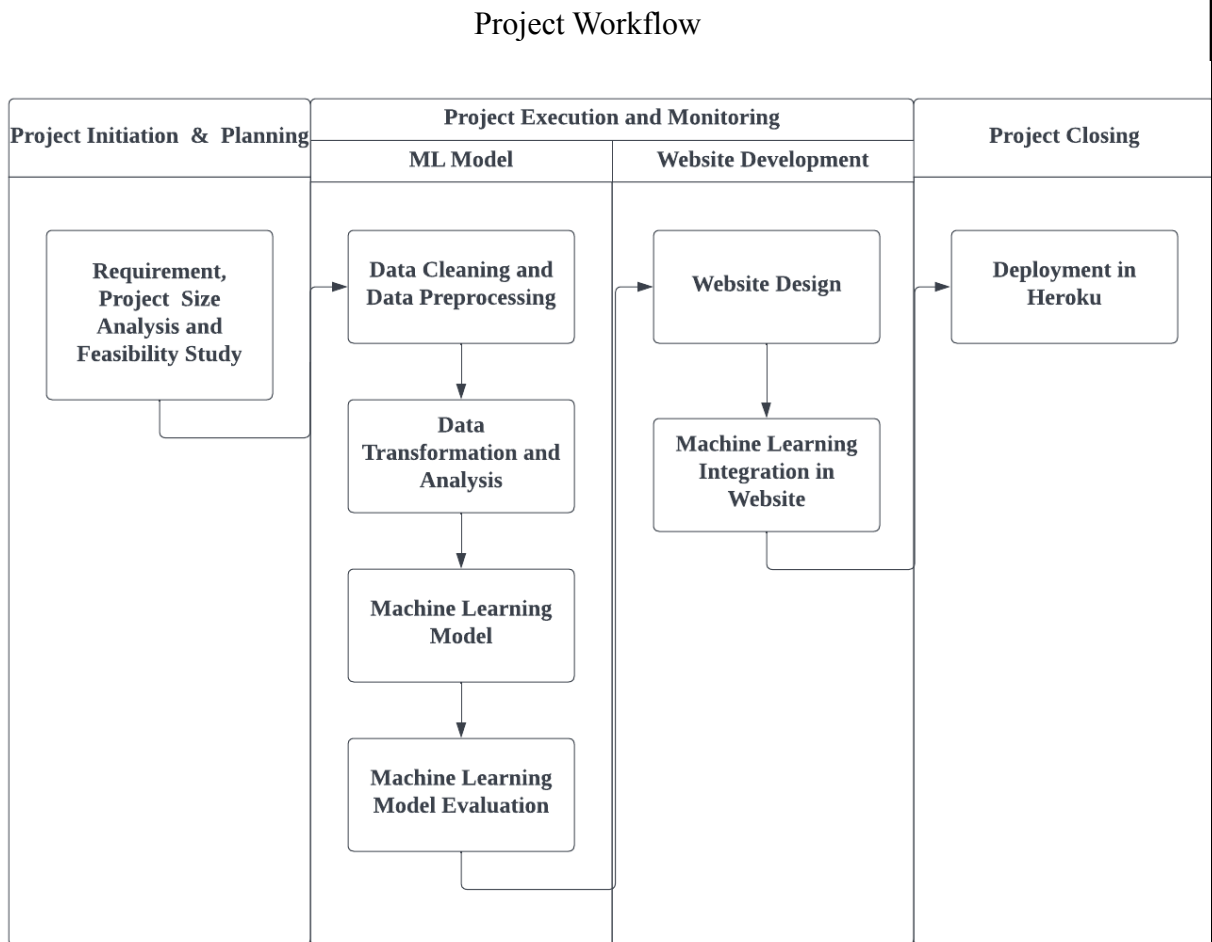


Table 1.1: Project Workflow

3.6 Deployment



Figure 1.2: Left-to-Right Deployment Model

For this project, a dashboard will be developed with the help of **Python** and **Plotly Dash** and will be deployed with the help of **Heroku**. The deployment environments included will be a typical local environment, a development environment for the developer to test anything, staging(a copy of the live dashboard before any changes are deployed) and finally the live environment for the final live website. Before deploying the live dashboard, the dashboard will be deployed in the GitLab.

4 Team Members Role

4.1 Member 1 Name and Role

Name : Anisha Rai

Role : Member

4.2 Member 2 Name and Role

Name : Rashmi Gurung

Role : Member

4.3 Member 3 Name and Role

Name : Sonam Dema

Role : Team Leader

4.4 Member 4 Name and Role

Name : Tashi Namgay

Role : Member

6. Project Schedule / Milestone Chart /Work plan

| No | Elapsed time from start (in months) of the project | Milestone | Deliverables |
|----|--|---|---|
| 1 | 14/03/2022 - 16/03/2022 | Topic Selection | Selection of topic done |
| 2 | 17/03/2022- 20/03/2022 | Project proposal preparation(aims, objectives, background,literature review,etc). | Project proposal report |
| 3 | 21/03/2022- 24/03/2022 | Data collection | Dataset from Kaggle |
| 4 | 25/03/2022- 10/04/2022 | Data Pre-processing | Cleaned data |
| 5 | 11/04/2022- 20/04/2022 | Extract, analyzing, manipulating data and interpreting result | Result |
| 6 | 21/04/2022- 05/05/2022 | Analytic or Machine Learning Model | Analytic or Machine Learning Model |
| 8 | 06/05/2022- 12/05/2022 | Dashboard design | A user-friendly Dashboard designed |
| 9 | 13/05/2022- 25/05/2022 | Deploy analytics model in the local environment and testing | Demonstrates all the functionality of model |
| 11 | 26/05/2022- 12/06/2022 | Deploy in GitLab then in Heroku | Live dashboard |
| 13 | 13/06/2022 | Presentation and demonstration | Presentation and Demonstration |

Table 1.2: Milestone

Gantt chart

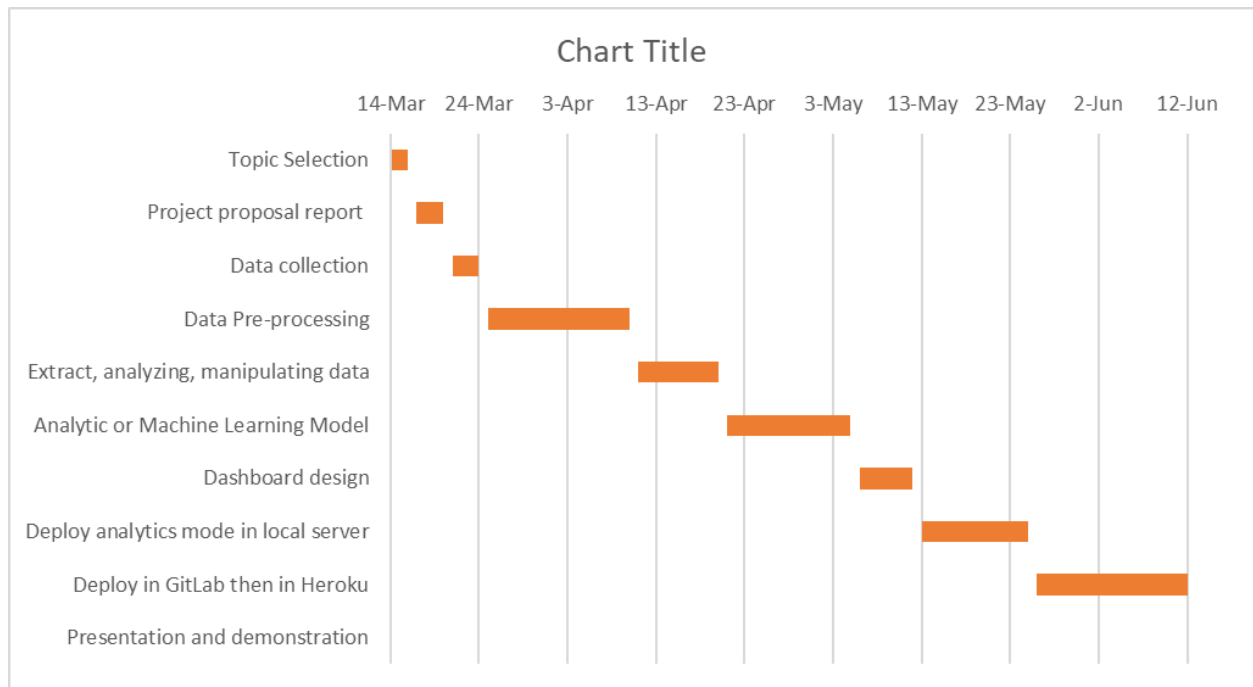


Figure 1.3: Gantt chart for milestone

7. Bibliography

B S, P., & Shastry, M. (2020). *Stock Price Prediction Using LSTM*. 83, 5246–5251.

Chavan, P. S., & Patil, S. T. (2013). Parameters for stock market prediction. *International Journal of Computer Technology and Applications*, 4(2), 337.

Doshi, A., Issa, A., Sachdeva, P., Rafati, S., & Rakshit, S. (2020, June 11). *Deep Stock Predictions*.

James, M. (2009, October 21). *Stock Market Prediction*. EzineArticles.

<https://ezinearticles.com/?Stock-Market-Prediction&id=3115806>

Sai, K. (2018, October 10). *Stock Market Prediction Using Machine Learning*.