Predicting stock prices is a difficult and widely researched problem that has attracted researchers and professionals from many walks of life, including economics, business, mathematics, and computer science. The near-random-walk characteristic of a stock time series makes stock market prediction a difficult and time-consuming endeavor. The stock market is a daily investment vehicle for millions of individuals throughout the world. Investors, managers, and decision-makers may all benefit from a reliable stock price prediction model. We summarize research on supervised ML models for stock market forecasting in this article. Stock market forecasts may be made more accurate with the use of supervised machine learning algorithms, according to the research. The most popular method for predicting stock prices is Support Vector Machine (SVM), which is known for its accuracy and strong performance. A number of other methods also shown encouraging prediction results, including Artificial Neural Networks (ANN), K-Nearest Neighbors (KNN), Naïve Bayes, Random Forest, Linear Regression, and Support Vector Regression (SVR).

I. INTRODUCTION

A large number of academics from disciplines as diverse as mathematics, computer science, business, and economics have focused on the difficult problem of predicting stock prices. Because of the high potential rewards, stock price prediction has received a lot of attention for a long time. The stock market's near-random-walk characteristic makes stock time series prediction a difficult endeavor. Because the stock market is so unpredictable, making predictions about it is one of the most labor-intensive jobs. Because stock market prediction is such a fruitful task, even a little improvement in the new model's forecast accuracy may result in enormous gains. The forecast relies heavily on stock prices. While the rapidly expanding financial markets have provided investors with exciting new opportunities, they have also presented financial analysts with new obstacles in their pursuit of sound decision-making and the mitigation of investment risk.

Due to the large number of interrelated variables that influence stock price movements in the future, the stock market is both a very dynamic and complicated system. The idea that financial markets can be reliably predicted is something that researchers have laboriously sought to establish. Investors have greater access to the stock markets because of the development and availability of technology. Machine learning, data mining, and statistical models are just a few of the approaches that have been suggested for predicting stock market movements by academics and businesses alike. Traders and financial institutions have developed a wide variety of proprietary models in an effort to outperform the market, but so far, no one has been consistently more profitable than average. Through the use of historical datasets, social media data, crawling financial news, and trends, machine learning has the ability to forecast stock market movements. Using supervised machine learning algorithms/techniques (Classification and Regression) to make stock market forecasts was the topic of this paper's discussion. Here is how the paper is structured: Part II details the procedures used to complete the evaluation, and Part III details the results and debate. Section IV draws conclusions.

II. SYSTEMATIC REVIEW METHODOLOGY

In this article, the researchers used a systematic literature review (SLR) approach. A systematic review is a research strategy and procedure for finding and evaluating relevant research, collecting and analyzing data from that study, and drawing conclusions from those findings. Planning, carrying out, and reporting are the three primary steps in carrying out a systematic review.
The following research issues were addressed via a literature study that drew from all of the published journal articles and conference proceedings:

**Answer 1:** When predicting the stock market, what supervised learning algorithms are most useful?

**Part 2:** How Do Stock Market Predictions Use Supervised Machine Learning?

The third research question concerns the relative merits of several supervised machine learning methods for stock market prediction.

**Questions 4 and 5:** Where does research on stock market prediction go from here?

**A. Methods for Surveilling Machine Learning for Stock Market Prediction**

Using machine learning to forecast the stock market with a greater degree of accuracy, with the goal of creating efficient and effective models [40]. Over the years, stock market forecasts have made use of a plethora of categorization and regression models. Improved results were obtained when several supervised machine learning methods were used for stock market prediction. Several supervised machine models and approaches have been developed or used for stock market prediction for over ten years. A large number of academics and industry professionals have worked tirelessly to develop an algorithm that can reliably anticipate the stock market.

Most published research on supervised machine learning methods for stock market prediction falls into one of these categories: were left out of the research:

- A comparison of regression algorithms
- A comparison of classification algorithms
- A comparison of both regression and classification algorithms when applied to

**Method B. Systematic Review of the Literature**

We gathered this collection of scholarly articles and conference proceedings from reputable online sources like IEEE Xplore, Science Direct, Google Scholar, Semantic Scholar, Open Access, and Springer. To find articles on stock market prediction using machine learning, supervised machine learning, classification, or regression algorithms, the following keywords are used: "stock market prediction using machine learning," "stock market prediction using supervised machine learning techniques/algorithms," and so on. Reasons for their exclusion from the research include their focus on supervised machine learning and stock market predictions. The number has been cut from 84 to 38 due to the articles.

For the purpose of excluding them from the research, the following studies were considered:

- Toss out if the article isn't focused on ML predictions.
- If the work doesn't cover the topic of Supervised Machine Learning in Stock Market Predictions, then don't include it.

**III. FINDINGS AND DISCUSSION**

The results of the first research question are covered in part 4.1, while the other research questions are addressed in Sections III.A, III.B, and III.C, respectively. In this part, we have offered detailed replies to the questions stated in Section II. The selected case studies provide in-depth responses to the study topics. The Application of Supervised Machine Learning (SML) to the Forecasting of Stock Prices The most popular supervised machine learning methods for stock market forecasting are shown in Table I. Depending on the study, researchers may have employed one or more than one.
Table II. AI Algorithms with Supervision

<table>
<thead>
<tr>
<th>Journal/Conference Paper</th>
<th>Stock Prediction Model</th>
<th>Algorithm Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert P. Shumakhor et al [9]</td>
<td>SVM</td>
<td>Regression</td>
</tr>
<tr>
<td>Han Lock Siew et al [11]</td>
<td>Linear Regression (LR)</td>
<td>Regression</td>
</tr>
<tr>
<td>Khalid Alkhathib et al [12]</td>
<td>KNN and Non-Linear Regression</td>
<td>Classification and Regression</td>
</tr>
<tr>
<td>Carol Hargreaves et al [13]</td>
<td>Logistic Regression</td>
<td>Regression</td>
</tr>
<tr>
<td>Absarul H. Majgi et al [14]</td>
<td>SVM-SMO</td>
<td>Classification</td>
</tr>
<tr>
<td>Santhil Mudge et al [4]</td>
<td>SVM</td>
<td>Classification</td>
</tr>
<tr>
<td>Hakeb Orjivanov et al [16]</td>
<td>SVM</td>
<td>Classification</td>
</tr>
<tr>
<td>Khan, W. Ghufoomifet et al [17]</td>
<td>SVM, KNN and Naive Bayes classifiers</td>
<td>Classification</td>
</tr>
<tr>
<td>Malak Zanik et al [18]</td>
<td>ANNS</td>
<td>Regression</td>
</tr>
<tr>
<td>Aruna Noyak et al [19]</td>
<td>Decision Tree, Logistic Regression and SVM</td>
<td>Classification and Regression</td>
</tr>
<tr>
<td>Mustansir Ghufoomifet et al [20]</td>
<td>SVM</td>
<td>Classification</td>
</tr>
<tr>
<td>Mr. Pramod Mali et al [21]</td>
<td>LR and Multiple Regression</td>
<td>Regression</td>
</tr>
<tr>
<td>Hafizan Gani et al [22]</td>
<td>SVM and ANN</td>
<td>Classification</td>
</tr>
<tr>
<td>D.A. Parvitasari et al [25]</td>
<td>SVM and KNN</td>
<td>Classification</td>
</tr>
</tbody>
</table>

Classification was shown to be the most used approach for stock market forecasting in Table II. Using the aforementioned research questions to provide a clear response to the first research question. Publications organized by method(s) used over a decade are shown in the following chart. While the chart remains static as a result of the articles that are available for this research. Articles published in 2013 make use of classification, regression, and comparisons between the two, as seen in Figure 2, while journals and conference papers published in 2006 and 2012 used regression techniques. Both 2014 and 2015 saw the writers publishing works that made use of categorization techniques. The number of articles comparing the two algorithms increased from one per year in 2016 to four in 2019 and three in 2020.

B. Using SML for Stock Market Forecasting

It all comes down to the performance of the supervised machine learning algorithms used for stock market prediction. Figure 2 and Table III provided a summary of the responses to the second research question of this paper. The second question sought to clarify the most common supervised machine learning algorithm used for stock market prediction from the 38 case studies, specifically in the classification and regression categories.
C. Where to take stock market prediction studies from here
Several computational models grounded in soft-computing and machine learning paradigms have been used in stock market analysis, prediction, and trading in order to circumvent the obstacles inherent in stock market analysis [40]. The use of methods such as Support Vector Machine (SVM), K-Nearest Neighbor (KNN), Support Vector Regression (SVR), Linear Regression, and Artificial Neural Network (ANN) has led to more accurate stock market forecasts. An effective method or methods are required to circumvent the obstacles encountered while using the current methods. Regardless of the resilience, high accuracy, and capacity to deal with noisy and missing data. One of the challenges of utilizing ANN for stock market prediction is over fitting. Outliners and parameter selection may also affect SVM. Even though training RNN models is challenging, the results of its predictions have been excellent. The free parameters that the user defines also have an impact on SVR. Research into supervised machine learning for stock market prediction should focus on fixing the aforementioned issues with current methods.

IV. CONCLUSION

Stock Market Prediction was the basis for the organization of the systematic review. We outlined the ways in which supervised machine learning algorithms and methods are used in this study to forecast the stock market. The stock market uses classification and regression to make predictions. We looked at the literature on these ideas and their implementations, and we compared them using characteristics that are relevant to current and future problems with predicting stock prices. In order to compile the data used in this analysis, researchers combed through the following databases: IEEE Explore, Science Direct, Google Scholar, Semantic Scholar, Open Access, and Springer, as well as searched by keyword index.
REFERENCES