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TIME TO TIME STOCK MARKET UPDATER AND MONITORING SYSTEM

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***Abstract*— The stock market domain is a dynamic and unpredictable environment. Stock market is seen as an everyday part of life in any economy is it developed or third world countries. As the world is gradually moving to the information age which a major characteristic of this age is speed; speed in sending messages, speed in healthcare delivery, speed in banking, there is a need for investors to be able to monitor their investments with speed. Traditional techniques, such as fundamental and technical analysis can provide investors with some tools for managing their stocks and predicting their prices. However, these techniques cannot discover all the possible relations between stocks and thus there is a need for a different approach that will provide a deeper kind of analysis. In this work, we introduce stock market updater and monitoring system which is an application for monitoring the activities that go on in the stock market. It tracks stock market activities as well as using the data that has been pooled to calculate the values of stock in an investor's portfolio all in real-time. It is hoped that this will help new investors in monitoring their investments firsthand without need for their brokers. Data mining can be used extensively in the financial markets and help in stock-price forecasting.**

Index Terms- Stock; stock market; stock monitoring; portfolio

I. INTRODUCTION

The The initial offering of stocks and bonds to investors is done in the primary market and subsequent trading is done in the secondary market. A stock exchange is often the most important component of a stock market. Supply and demand in stock markets is driven by various factors that, as in all free markets, affect the price of stocks. The stock exchange helps companies generate capital. As a primary market, it provides an avenue for them to sell new shares and bonds to investors. The companies can then use the proceeds from these sales to expand their businesses, develop new products, buy new equipment etc. Nwaiwu (2004) says that the stock market also provides a means for investors to trade in the shares of companies they own among themselves. In other words, it serves as a secondary market. For example, a person who bought the shares of a company at a particular price may sell it to another investor. The investors are the ones who profit from this type of trade – companies do not. The stock exchange also has the function of upholding rules and regulations so that shady people do not cheat investors of their hard earned money. It gives investors security. There is usually no compulsion to issue stock via the stock exchange itself, nor must stock be subsequently traded on the exchange. Such trading is said to be off exchange or over- the-counter. This is the usual way that derivatives and bonds are traded. Increasingly, stock exchanges are part of a global market for securities.

Nyong (1997) said that the stock market is viewed as a complex institution imbued with inherent mechanism through which long-term funds of the major sectors of the economy comprising households, firms, and government are mobilized, harnessed and made available to various sectors of the economy. The rate at which the values of stocks and bonds for stocks rise and fall can be very hard to follow for various investors which can lead to the loss of valuable money that can be made through either the sale or buying of shares. While only stock brokers are allowed to trade, it is the investors that tell them what to trade with therefore if the investors do not know. To buy and to sell then it can be hard for them to make money in the stock exchange. In summary the problem is the inability of shareholders to see and understand the rise and fall stocks and share prices as it relates to their various investments. The aim of this paper is to develop a prototype of an application that is able to monitor the trading floor of the Stock Exchange as well as the stocks and shares in an investor's portfolio.

II. PROPOSED SYSTEM

The rationale behind mining frequent item sets is that only item sets with high frequency are of interest to users. However, the practical usefulness of frequent item sets is limited by the significance of the discovered item sets. A frequent item set only reflects the statistical correlation between items, and it does not reflect the semantic significance of the items. In this paper, we propose a utility based item set mining approach to overcome this limitation. The proposed approach permits users to quantify their

preferences concerning the usefulness of item sets using utility values. The usefulness of an item set is characterized as a utility constraint. That is, an item set is interesting to the user only if it satisfies a given utility constraint. We show that the pruning strategies used in previous item set mining approaches cannot be applied to utility constraints. In response, we identify several mathematical properties of utility constraints. Then, two novel pruning strategies are designed. Two algorithms for utility based item set mining are developed by incorporating these pruning strategies. The algorithms are evaluated by applying them to synthetic and real world databases. Experimental results show that the proposed algorithms are effective on the databases tested.

III. PROCESS MODELS

3.1 Waterfall Model

The Waterfall Model was the first Process Model to be introduced. It is also referred to as a linear-sequential life cycle model. It is very simple to understand and use. In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases. The Waterfall model is the earliest SDLC approach that was used for software development. The waterfall Model illustrates the software development process in a linear sequential flow. This means that any phase in the development process begins only if the previous phase is complete. In this waterfall model, the phases do not overlap.

3.1.1 Waterfall Model - Design

Waterfall approach was first SDLC Model to be used widely in Software Engineering to ensure success of the project. In "The Waterfall" approach, the whole process of software development is divided into separate phases. In this Waterfall model, typically, the outcome of one phase acts as the input for the next phase sequentially.

The following illustration is a representation of the different phases of the Waterfall Model.

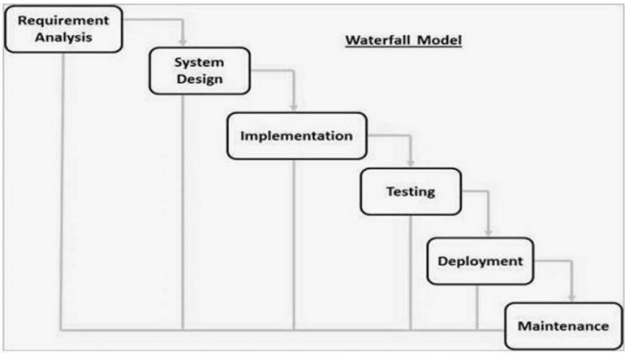

Figure 1: The sequential phases in waterfall model

3.2 Phases in Waterfall model

Requirement Gathering and analysis − All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document.

System Design − The requirement specifications from first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.

Implementation − With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit

Testing. Integration and Testing − All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

Deployment of system − Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market.

Maintenance − There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

IV. SOFTWARE ENVIRONMENT

4.1. JAVA TECHNOLOGY

The following Java technology lets developers, designers, and business partners develop and deliver a consistent user experience, with one environment for applications on mobile and embedded devices. Java meshes the power of a rich stack with the ability to deliver customized experiences across such devices. Java APIs are libraries of compiled code that you can use in your programs. They let you add ready-made and customizable functionality to save you programming time. Java programs are run (or interpreted) by another program called the Java Virtual Machine. Rather than running directly on the native operating system, the program is interpreted by the Java VM for the native operating system. This means that any computer system with the Java VM installed can run Java programs regardless of the computer system on which the applications were originally developed. In the Java programming language, all source code is first written in plain text files ending with the .java extension. Those source files are then compiled into .class files by the java compiler. A .class file does not contain code that is native to your processor; it instead contains bytecodes — the machine language of the Java Virtual Machine (Java VM). The java launcher tool then runs your application with an instance of the Java Virtual Machine. Because the Java VM is available on many different operating systems, the same .class files are capable of running on Microsoft Windows, the Solaris TM Operating System (Solaris OS), Linux, or Mac OS. Java technology is both a programming language and a platform. The Java Programming Language: The Java programming language is a high-level language that can be characterized by all of the following buzzwords:

- Simple
- Object oriented
- Distributed
- Multithreaded
- Dynamic
- Architecture neutral

• Portable

• High performance

• Robust

• Secure

Each of the preceding buzzwords is explained in The Java Language Environment, a white paper written by James Gosling and Henry Milton. In the Java programming language, all source code is first written in plain text files ending with the .java extension. Those source files are then compiled into .class files by the java compiler. A .class file does not contain code that is native to your processor; it instead contains bytecodes— the machine language of the Java Virtual Machine1 (Java VM). The java launcher tool then runs your application with an instance of the Java Virtual Machine.

4.2 AN OVERVIEW OF THESOFTWARE DEVELOPMENT PROCESS

Because the Java VM is available on many different operating systems, the same .class files are capable of running on Microsoft Windows, the Solaris™ Operating System (Solaris OS), Linux, or Mac OS. Some virtual machines, such as the Java Hotspot virtual machine, perform additional steps at runtime to give your application a performance boost. This include various tasks such as finding performance bottlenecks and recompiling (to native code) frequently used sections of code

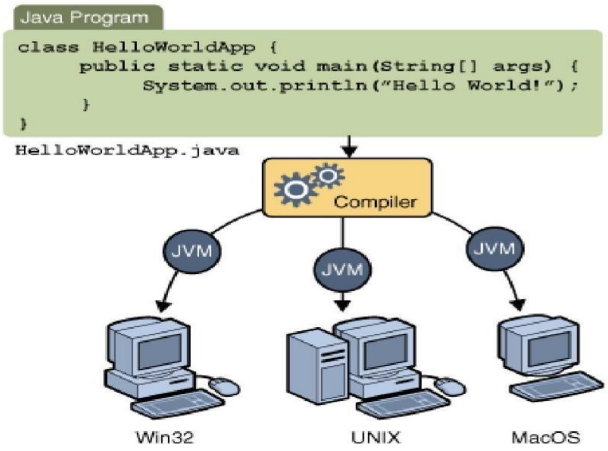

Figure 2: Java Virtual machine

Through the Java VM, the same application is capable of running on multiple platforms.

4.3. HTML

HTML, an initialize of Hypertext Markup Language, is the predominant markup language for web pages. It provides ameans to describe the structure of text-based information in a document — by denoting certain text as headings, paragraphs, lists, and so on — and to supplement that text with interactive forms, embedded images, and other objects. HTML is written in the form of labels (known as tags), surrounded by angle brackets. HTML can also describe, to some degree, the appearance and semantics of a document, and can include embedded scripting language code which can affect the behavior of web browsers and other HTML processors. HTML is also often used to refer to content of the MIME type text/html or even more broadly as a generic term for HTML whether in its XML-descended form (such as XHTML 1.0 and later) or its form descended directly from SGML

Hyper Text Markup Language:

Hypertext Markup Language (HTML), the languages of the World Wide Web (WWW), allows users to produces Web pages that include text, graphics and pointer to other Web pages (Hyperlinks). HTML is not a programming language but it is an application of ISO Standard 8879, SGML (Standard Generalized Markup Language), but specialized to hypertext and adapted to the Web. The idea behind Hypertext is that instead of reading text in rigid linear structure, we can easily jump from one point to another point. We can navigate through the information based on our interest and preference. A markup language is simply a series of elements, each delimited with special characters that define how text or other items enclosed within the elements should be displayed. Hyperlinks are underlined or emphasized works that load to other documents or some portions of the same document. HTML can be used to display any type of document on the host computer, which can be geographically at a different location. It is a versatile language and can be used on any platform or desktop. HTML provides tags (special codes) to make the document look attractive. HTML tags are not case- sensitive. Using graphics, fonts, different sizes, color, etc., can enhance the presentation of the document. Anything that is not a tag is part of the document itself.

4.4 JAVA SCRIPT

Java script is a general purpose, prototype based, object oriented scripting language developed jointly by sun and Netscape and is meant for the WWW. It is designed to be embedded in diverse applications and systems, without consuming much memory. Java script borrows most of its syntax from java but also inherits from ask and Perl, with some indirect influence from self in its object prototype system. Java scripts dynamically typed that is programs do not declare variable types, and the type of variable is unrestricted and can change at run time. Source can be generated at run time and evaluated against an arbitrary scope. Typical implementations compile by translating source into a specified byte code format, to check syntax and source consistency. Note that the availability to generate and interpret programs at runtime implies the presence of a compiler at runtime. Java script is a high level scripting language that does not depend on or expose particular machine representations or operating system services. It provides automatic storage management, typically using a garbage collector

4.5. JAVA SERVER PAGES (JSP)

Java server Pages is a simple, yet powerful technology for creating and maintaining dynamic content web pages. Based on the Java programming language, Java Server

Pages offers proven portability, open standards, and a mature re-usable component model. The Java Server Pages architecture enables the separation of content generation from content presentation. This separation not eases maintenance headaches; it also allows web team members to focus on their areas of expertise.

V. SYSTEM DESIGN

INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things: What data should be given as input? How the data should be arranged or coded? The dialog to guide the operating personnel in providing input. Methods for preparing input validations and steps to follow when error occur.

OBJECTIVES

Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system. It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities. When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow.

OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision- making. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements. Select methods for presentin g information.

Create document, report, or other formats that contain information produced by the system. The output form of an information system should accomplish one or more of the following objectives. Convey information about past activities, current status or projections of the Future. Signal important events, opportunities, problems, or warnings. Trigger an action. Confirm an action.

VI. IMPLEMENTATION AND TESTING

6.1MODULE DESCRIPTION:

Number of Modules After careful analysis the system has been identified to have the following modules:

- Stock Trading Module.
- Temporal Data Mining Module.
- Time series Module.
- Principle of Apriority Algorithm Module

6.1.1. Stock Trading Module:

The main function of a stock market is the dealings of stock between investors. Stocks are grouped into industry groups according to their primary business focus. A transaction is willing of an investor to sell some stock is not only characterized by its price but also buy many others variables. There is an interaction among all these variables and only s deep study could show the behavior of a stock over time.

6.1.2. Temporal Data Mining Module:

Temporal data mining Is a single step in the process of Knowledge Discovery in Temporal Databases that enumerates structures (temporal patterns or models) over the temporal data. Examples of temporal data mining tasks are classification and clustering of time series, discovery of temporal patterns or trends in the data, associations of events over time, similarity- based time series retrieval, time series indexing and segmentation. In the stock market domain, temporal data mining could indeed play an essential role.

6.1.3.Time Series Module:

A Time Series is an ordered sequence of data points. Typically, it's measured at successive times spaced at uniform time intervals. A huge amount of data is collected every day in the form of event time sequences. Common examples are recording of different values of stock shares during a day, each access to a computer by an external network, bank transactions, or events related to malfunctions in an industrial plant. These sequences represent valuable sources of information not only to search for a particular value or event at a specific time, but also to analyze the frequency of certain events, discover their regularity, or discover set of events related by particular temporal relationships. These types of analyses can be very useful for deriving implicit information from the raw data, and for predicting the future behavior of the process that we are monitoring.

6.1.4. Principle of Apriority Algorithm Module:

One of the most common approaches to mining frequent patterns is the apriority method and when a transactional database represented as a set of sequences of transactions

performed by one entity is used, the manipulation of temporal sequences requires that some adaptations be made to the apriority algorithm. The most important modification is on the notion of support: support is now the fraction of entities, which had consumed the item sets in any of their possible transaction, i.e. an entity could only contribute one time to increment the support of each item set, beside it could had consumed that item set several times. After identifying the large item sets, the item sets with support greater than the minimum support allowed, they are translated to an integer, and each sequence is transformed in a new sequence, whose elements are the large item sets of the previous-one. The next step is to find the large sequences. For achieve this, the algorithm acts iteratively as apriority: first it generates the candidate sequences and then it chooses the large sequences from the candidate ones, until there are no candidates. One of the costliest operations in apriority- based approaches is the candidate generation.

6.2 TESTING

6.2.1 Testing Methodologies

Testing is the process of finding differences between the expected behavior specified by system models and the observed behavior implemented system. From modeling point of view, testing is the attempt of falsification of the system with respect to the system models. The goal of testing is to design tests that exercise defects in the system and to reveal problems. The process of executing a program with intent of finding errors is called testing. During testing, the program to be tested is executed with a set of test cases, and the output of the program for the test cases is evaluated to determine if the program is performing as expected. Testing forms the first step in determining the errors in the program. The success of testing in revealing errors in program depends critically on test cases.

6.2.2 Strategic Approach to Software Testing

The software engineering process can be viewed as a spiral. Initially system engineering defines the role of software and leads to software requirements analysis where the information domain, functions, behavior, performance, constraints and validation criteria for software are established. moving inward along the spiral, we come to design and finally to coding. To develop computer software, we spiral in along streamlines that decreases the level of abstraction on each item. A Strategy for software testing may also be viewed in the context of the spiral. Unit testing begins at the vertex of the spiral and concentrates on each unit of the software as implemented in source code. Testing will progress by moving outward along the spiral to integration testing, where the focus on the design and the concentration of the software architecture. Talking another turn on outward on the spiral we encounter validation testing where requirements established as part of software requirements analysis are validated against the software that has been constructed. Finally, we arrive at system testing, where the software and other system elements are tested as a whole.

6.3 Testing Activities:

Different levels of testing are used in the testing process; each level of testing aims to test different aspects of the system. the basic levels are: Unit testing Integration testing System testing Acceptance testing

6.4. Test Plan

Testing process starts with a test plan. This plan identifies all the testing related activities that must be performed and specifies the schedules, allocates the resources, and specified guidelines for testing. During the testing of the unit the specified test cases are executed and the actual result compared with expected output. The final output of the testing phase is the test report and the error report.

6.5. Test Data

Here all test cases that are used for the system testing are specified. The goal is to test the different functional requirements specified in Software Requirements Specifications (SRS) document.

6.6. Unit Testing

Each individual module has been tested against the requirement with some test data.

6.7. Test Report

The module is working properly provided the user has to enter information. All data entry forms have tested with specified test cases and all data entry forms are working properly.

6.8. Error Report

If the user does not enter data in specified order then the user will be prompted with error messages. Error handling was done to handle the expected and unexpected errors.

6.9. Test cases

A Test case is a set of input data and expected results that exercises a component with the purpose of causing failure and detecting faults. test case is an explicit set of instructions designed to detect a particular class of defect in a software system, by bringing about a failure. A Test case can give rise to many tests.

Test Cases

Test cases can be divided in to two types. First one is Positive test cases and second one is negative test cases. In positive test cases are conducted by the developer intention is to get the output. In negative test cases are conducted by the developer intention is to don't get the output.

S .No	Test case Description	Actual value	Expected value	Result
1	Create new user registration process	Enter the personal info and address info.	Update personal info and address info in to oracle database successfully	True
2	Enter the username and password	Verification of login details.	Login Successfully	True
3	Upload Document	Enter all fields	Data uploaded successfully	True
4	Ask Question?	Select the Category and Upload the Question	Getting the Relevant answer for the Question	True

+VE TEST CASES

-VE TEST CASES

S .No	Test case Description	Actual value	Expected value	Result
1	Create the new user registration process	Enter the personal info and address info.	Personal info and address info its not update into database successfully.	False
2	Enter the username and password	Verification of login details.	Login failed	False

VII. SCREENS

Figure 3: Home Page

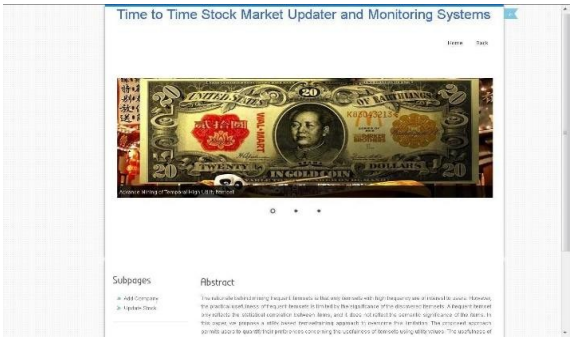

Figure 4: Admin page

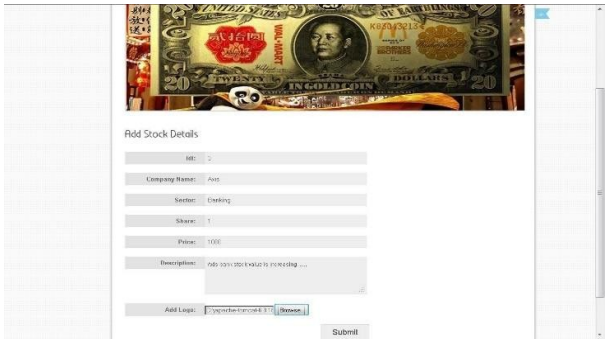

Figure 5: Add company

Figure 6: Stock details

Figure 7: User registration page

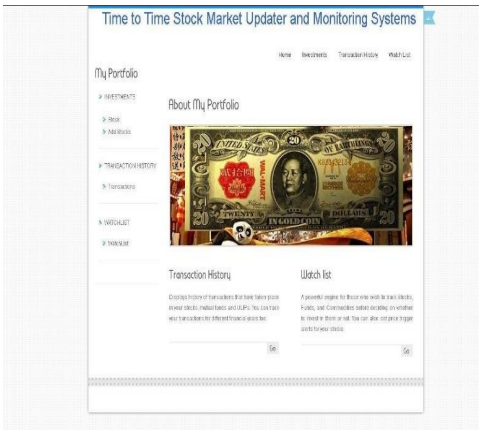

Figure 8: User page

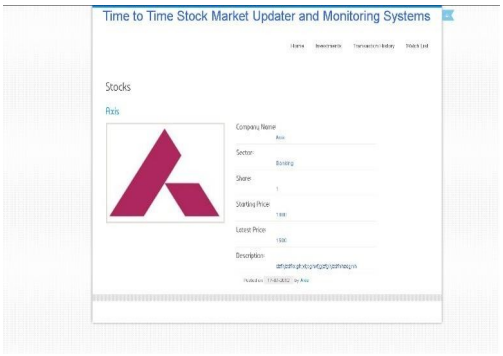

Figure 9: Stock Details

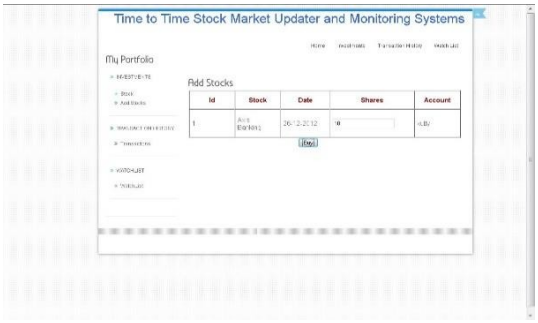

Figure 10: Add stock

Figure 11: Transaction history

VIII.CONCLUSION

The importance of a stock market to the economy cannot be over emphasized. It is a channel of success for a new or existing business and for any personal investor. Therefore, the success of any company is usually tied to its performance in the stock exchange which also means the success of everyone who has invested in that company. The concept of investing therefore cannot be overlooked because if there is an increase in the value of a company there is most definitely from the company or an increase in the dividends for an individual investor that can be reaped from the sale of its shares. Investing that can be defined as using money to participate in a business venture via the purchase of stocks and bonds in the business gives rise to stock monitoring as an investor has to know the progress of the stocks and bonds in the market. It stands to give the investor the chance to see how each stock progress instead of leaving it to his or her broker. It also helps if the investor does not have to look for dailies. This is what has brought forth the need for an efficient stock monitoring system to see how it progresses so that with the internet each change in stock value can be viewed as it happens in real time. The aim of this project was to design a prototype for a system that can monitor an individual investor's stock and also give him a general detail of the stock market. It has been able to integrate the basic information as needed for every investor. It can also serve as a valuable tool for any new investor into the stock exchange. it has been found out that stock market monitoring is the way of life for any investor but a new frontier is being opened up in stock market prediction. The next phase of this work is to incorporate some level of intelligence into the system. This will make use of past and present data for predicting future trends in the stock market.

REFERENCES

[1] SachinSampatPatil, Prof. Kailash Patidar, Asst. Prof. Megha Jain, "A Survey on Stock Market Prediction Using SVM", IJCTET 2016.

[2] H. Gunduz, Z. Cataltepe and Y. Yaslan, "Stock market direction prediction using deep neural networks," 2017 25th Signal Processing and Communications Applications Conference (SIU), Antalya, 2017, pp. 1-4.

[3] M. Usmani, S. H. Adil, K. Raza and S. S. A. Ali, "Stock market prediction using machine learning techniques," 2016 3rd International Conference on Computer and Information Sciences (ICCOINS), Kuala Lumpur, 2016, pp. 322-327.

[4] H. L. Siew and M. J. Nordin, "Regression techniques for the prediction of stock price trend," 2012 International Conference on Statistics in Science, Business and Engineering (ICSSBE), Langkawi, 2012, pp. 1-5.

[5] S. Liu, G. Liao and Y. Ding, "Stock transaction prediction modelling and analysis based on LSTM," 2018 13th IEEE Conference on Industrial Electronics and Applications (ICIEA), Wuhan, 2018, pp. 2787-2790.

[6] M. Billah, S. Waheed and A. Hanifa, "Stock market prediction using an improved training algorithm of neural network," 2016 2nd International Conference on Electrical, Computer & Telecommunication Engineering (ICECTE), Rajshahi, 2016, pp. 1-4.

[7] T. Gao, Y. Chai and Y. Liu, "Applying long short term memory neural networks for predicting stock closing price," 2017 8th IEEE International Conference on Software Engineering and Service Science (ICSESS), Beijing, 2017, pp. 575-578.

[8] K. A. Althelaya, E. M. El-Alfy and S. Mohammed, "Evaluation of bidirectional LSTM for short-and long-term stock market prediction," 2018 9th International Conference on Information and Communication Systems (ICICS), Irbid, 2018, pp. 151-156.

[9] S. Qamar, and S. H. Adil, Comparative analysis of data mining techniques for financial data using parallel processing, In Proceedings of the7th International Conference on Frontiers of Information Technology,2009.

[10] Ashish Sharma, Dinesh Bhuriya, Upendra Singh. "Survey of Stock Market Prediction Using Machine Learning Approach", ICECA 2017.

[11] Xi Zhang1, Siyu Qu1, Jieyun Huang1, Binxing Fang1, Philip Yu2, "Stock Market Prediction via Multi-Source Multiple Instance Learning." IEEE 2018.

[12] Hakob GRIGORYAN, "A Stock Market Prediction Method Based on Support Vector Machines (SVM) and Independent Component Analysis (ICA)", DSJ 2016.

[13] VivekKanade, BhausahebDevikar, SayaliPhadatare, PranaliMunde, ShubhangiSonone. "Stock Market Prediction: Using Historical Data Analysis", IJARCSSE 2017.

[14] K. V. Sujatha and S. M. Sundaram, "Stock index prediction using regression and neural network models under non normal conditions," INTERACT-2010, Chennai, 2010, pp. 59-63.

[15] RautSushrut Deepak, ShindeIshaUday, Dr. D. Malathi, "Machine Learning Approach In Stock Market 9. Prediction", IJPAM 2017.

[16] Pei-Yuan Zhou , Keith C.C. Chan, Member, IEEE, and Carol XiaojuanOu, "Corporate Communication Network and Stock Price Movements: Insights From Data Mining", IEEE 2018.

[17] K. Raza, "Prediction of Stock Market performance by using machine learning techniques," 2017 International Conference on Innovations in Electrical Engineering and Computational Technologies (ICIEECT), Karachi, 2017, pp. 1-1.

[18] S. H. Adil, and S. Qamar. Implementation of association rule mining using CUDA, International Conference on Emerging Technologies (ICET),2009.

[19] Loke.K.S. “Impact Of Financial Ratios And Technical Analysis On Stock Price Prediction Using Random Forests”, IEEE, 2017.