

Data Exploration Using Data Analytics Based Techniques: Share Trade System

Rohini M. Warhekar# & Dr. S. R. Gupta*

#ME scholar , Department of Computer Science & Engineering, PRMIT&R,Badnera

*Assistant Professor, Department of Computer science and engineering, PRMIT&R,Badnera

Abstract: *Communication System is developed for Stock Trading Firm. Earlier, stock holder clients could get information related to stock market through traditional media. To get information about stock market, the stock holder could get updates from various television channels related to stock market. Since the internet has become more popular the updates could be taken from a stock marketing website. But this procedure of visiting a website or getting information from television channels is time consuming. Just to get updates about the stock market, these methods are inefficient and type of inflexible communication to take place. For this future generation, the next step to make it more convenient, transition using a mobile Application is the convenient 1 solution*

1. Introduction

The intention behind creating this application is to provide a simple yet efficient way for Admin to handle users and to manipulate transactions about stock market. Communication will be done by transition of messages using Web Application and Android Application. In this, we are implementing PUSH technology for communication. Communication will be one sided from Admin to Clients. There is Web Application provided to Admin for manipulating data related to clients. Client will be provided with Android Application on their devices (mobile phones) so that Firm (Admin) can communicate with their clients on daily basis by sending notifications. The clients will be categorized into Sub-Brokers, Dealers, User clients, etc.

Earlier, stock holder clients could get information related to stock market through traditional media. To get information about stock market, the stock holder could get updates from various television channels related to stock market. Now a days, people use technologies such as mobile phones, internet to communicate, and retrieve the information about stock market. But these are time consuming techniques. To overcome these delays and unnecessary work, we are developing a system which allows user to get information regarding stock market directly on their account. For the communication between the administrator and the clients, calls are made from the administrator to the

clients on a regular basis. Various firms or banks generally use emails or messaging (SMS system) to communicate with the client. This is a inflexible type of communication to take place. Clients want an easier way to know about their transactions according to their convenience.

Now a days , large amount of trivial data is generating daily. By using data exploration and mining techniques, we can use this data to explore and to find different patterns and important information. This same approach is used in our project. From large amount of data we are proving important stock market data (information) to the user.

1.1 Objective:

Our objective behind designing this system is to provide customers the information about stock market. The traditional communication techniques have worked well for us but now-a-days they are outdated because of their inefficiency. For this future generation the next step is to make it more convenient for that, transition using a mobile Application is the best solution. Using the mobile application we are provided with easier way to communicate with clients. Our clients are categorized into Sub-Brokers, Dealers, User clients, etc.

2 Literature Review:

Prediction of the stock market has always been an interesting activity for many researchers all round the globe because of the lucrative gains involved in it. The ability of stocks to absorb and act on information that is immediately reflected in its prices makes them a very interesting investment option. Academicians and researchers have shown keen interest in studying the predictability of the stock prices, since it throws more light in understanding the behavior and dynamics of the stock market. Bachelier (1900) was the first to talk about the random characteristics of share price behavior followed by Working (1934) & Kendall (1953). It was Fama E (1965) who, in his notable study provided economic justification for the random walk model and coined the term, EMH. From then on, the number of studies trying to study the

efficiency of stock markets was on the rise, and every study contributed in a significant way to understand the behavior and predictability of markets. This chapter tries to trace various research studies in the field of market efficiency, illustrating the empirical evidences for and against it, from developed and emerging markets. Research works with applications of data exploration approaches to stock price behavior are included and inferences are drawn.

There is a large body of research carried out suggesting the predictability of stock markets. Lo & MacKinlay (1988) in their research paper claim that stock prices do not follow random walks and suggested considerable evidence toward predictability of stock prices. Basu (1977), Fama & French (1992), Lakonishok et al (1997) in their various studies have carried many cross-sectional analyses across the globe and tried to establish the predictability of the stock prices. Studies have tried to establish that various factors like firm size, book to market equity, and macroeconomic variables like short-term interest rates, inflation, yield from short- and long term bonds, and GNP help in the predictability of stock returns (Fama & French (1993), Campbell (1987), Chen, Roll & Ross (1986), Cochrane (1988)]. Ferson & Harvey (1991) show that predictability in stock returns are not necessarily due to market inefficiency or over-reaction from irrational investors but rather due to predictability in some aggregate variables that are part of the information set. O'Connor et al (1997) demonstrated the usefulness of forecasting the direction of change in the price level, that is, the importance of being able to classify the future return as a gain or a loss.

3 Existing System

As the dynamic stock market leaves a trail of huge amount of data, storing and analyzing these tera-bytes of information has always been a challenging task for the researchers. After the advent of computers that have brute processing power, storage technologies such as databases, data warehouses, and the modern data exploration algorithms, information systems play a pivotal role in the stock market analysis. Data exploration provides nontrivial extraction of implicit, previously unknown, and potentially useful information from the data and thus it emerges as an invaluable knowledge discovery process. The four major approaches of data exploration are classification, clustering, association rule mining, and estimation. In the recent years, data exploration has developed sophisticated applications that are capable of mining useful information for a large database. Soft

computing techniques like ANN, Fuzzy Logic, Genetic Algorithm (GA), Machine Learning techniques, etc., have been generously employed to analyze time series data for various purposes like classification, prediction, association etc. Hence, lot of research work is attempted to apply comprehensive data exploration tools to financial time series data like stock market/stock index prices, to identify if the behavior of prices can be better understood by the use of technology.

In practice, we use Deep Learning methods, specifically Recurrent Neural Networks (RNN). The models we started with and have in production right now consist of several stages:

- First, we perform adaptive filtering of the raw price data
- Then we feed filtered data into the RNN model and train it
- Then we perform predictions and prepare the recommendations using those prediction

Clearly, it's not the end of the story. We want more accurate and easy to use predictions, thus we are in constant R&D on the new models. From what we know now, I can say that some specific Convolution Neural Networks (CNN) architectures allow to perform more accurate predictions not requiring previous out-of-model filtering. We test such models right now and hope to make their results available soon.

We're also actively looking in methods which combine neural networks and Bayesian inference.

4 Existing Technology

We are designing an Web Application and Android Application for communication purpose. One of the most important job of our application is to receive messages and notifications from our administrator of our Stock Trading Firm. Desired client have their personal details for accessing their application. We are designing Web application for sending trade confirmation messages and news updates to clients. Client will be able to view the messages on their android application.

Using this communication system, Administrator will provide their clients with updates of Stock Market in form of newsletters and blogs. Using this, clients also have facility to give their feedbacks and suggestions.

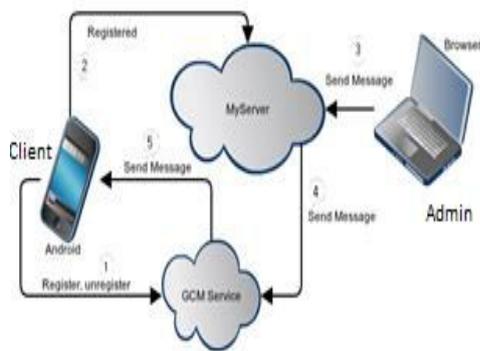


Figure1: Basic architecture of Communication System

Basic architecture of this Communication System is shown in fig 1. In this, transferring of messages from initial process to end is clarified. Firstly, on installing FCM enabled android application in mobile device, FCM service will generate a new unique registration id for each time of installation and get saved in FCM server. If application is already installed in mobile device then using registration id of that device, message can be send or receive. When message is sent from web application or browser for the particular registration id, it is firstly forwarded to FCM server and it will check whether the registration id is valid or not and then later the message will be sent to FCM service. At last, FCM service will push the notification to specific registration id based android application and device.

5 Feasibility Study

Admin- Web Application

Admin have facility to login using their username and password. Clients firstly have to register with the Firm with their valid personal details and Client registration is done by the Admin. Registration details includes client's user name, mobile number, Email Id, Category, Password, etc. Clients will be identified using their mobile numbers as their unique identification. Clients that are registered will only be able to use the android application and can be a part of this communication system. Password of each of the client will be automatically generated at the time of Registration. Password and APK file will be sent to the clients by sending it to their particular Email id or mobile number that is in form of mail or text message after registration. Clients are categorized into categories such as Dealers, Sub-Brokers, User clients ,etc. Admin can view details of all the clients except their password and can update details if needed. Now the main job of admin is to communicate with the clients by transition of messages that includes:

- a) Trade Confirmation.

- b) Daily Updates [Newsletter, one at start of day and one at end of day]
- c) Weekly & Monthly Updates [Markets and other Updates]
- d) Research Information.

Newsletters can be sent in form of URL or text format. It can be related to stock market updates or any other relating business, entertainment, sports. Trade confirmation includes transaction messages as if a person transact to their stock account such as buying or selling shares of any company. So they will be notified for confirmation of their transaction. Admin also have facility for multicasting of messages. Messages can also be send to various or specific category of clients. For messages to be sent, Admin module must contain application id and project number of android application and FCM generated registration id of each registered client. Firm can also get Feedback, issues or constraints regarding communication from the clients which can be viewed or checked by the Admin. Web Application will include session constraint as per security aspect. For all these processes to be happen, Admin Web application must be on server so that it can remotely accessible.

Google Cloud Messaging Service

FCM service is used to send notifications or messages from one web end or application end to another application end. For FCM service to be activated, firstly we have to registered on Google console with our android project package name and it will generate some keys that will be needed in our both front ends. Keys include:

1. Application Id
2. Sender Id
3. Phone number

FCM also generate configuration file that include all project details including package name and keys which have to be included in Android project. FCM will also generate unique registration id for each of the android device, on installing the FCM enabled android application. Sender Id, Application Id and Registration Id are required in the Web Application (Admin side) for performing message sending transition, configuration file, Project number and Sender Id are required in the Android Application (clients) for receiving notifications and messages.

Database Management

For the Data storage and management, we have used SQL Server 2012. Database designed for the project includes four general tables that is of admin login, client information, message history, newsletter history, research information or blogs history and feedback history. Admin login includes Admin username and password. Client information includes

personal details of the client taken during registration and also FCM registration Id. History tables include history of each messages sent category wised with FCM registration id and mobile number. Additional tables can be added later if required.

6 Conclusion

We have implemented a One-sided Communication System for Stock Trading Firm for the Firm Administrator and their clients using unidirectional push technology. It is developed using Web Application for Administrator and Android Application for clients. Using this, stock clients are in touch with their stock accounts and daily updates occur in stock market. Clients can be known with their transactions, stock updates, daily newsletters updates and research information. Systematic approach is provided to the clients to handle and explore their application and in a well organized manner.

REFERENCE

- [1]Lemke, Thomas; Lins, Gerald. "2:25-2:29". *Soft Dollars and Other Trading Activities* (2013-2014 ed.). Thomson West. ISBN 978-0-314-63065-0.
- [2] "Concept Release on Risk Controls and System Safeguards for Automated Trading Environments" (PDF). Commodity Futures Trading Commission. September 9, 2013. Retrieved December 22, 2014.
- [3] "As automated trading takes over markets, rational human investors matter even more. - Abernathy MacGregor".
- [4]"A day in the quiet life of a NYSE floor trader". 29 May 2013.
- [5][https://www.tradestation.com/~media/Files/Trade Station/Education/University/School%20of%20Strategy%20Trading/Books/Designing%20and%20Using%20Strategies.ashx%7CChapter 3](https://www.tradestation.com/~media/Files/Trade%20Station/Education/University/School%20of%20Strategy%20Trading/Books/Designing%20and%20Using%20Strategies.ashx%7CChapter%203)
- [6]http://www.futuresindustry.org/downloads/FIA_Special_Report_090913.pdf
- [7]Giovanni Cespa, Xavier Vives (February 2017). "High frequency trading and fragility" (PDF). Working Papers Series. European Central Bank (2020). This supports regulatory concerns about the potential drawbacks of automated trading due to operational and transmission risks and implies that fragility can arise in the absence of order flow toxicity.
- [8]CFTC Publishes Sweeping Concept Release Asking Questions About Additional Regulation of Automated Trading Strategies and High-Frequency Trading" - JD Supra".