Financial Calculator and Investment Advisor

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Abstract

The application is designed to do many financial calculations as well as to advise the user as to where he should invest his money. This is an android operating system based mobile application that will help user to make smart decision on investing the valuable savings or income. This application will analyze the real time market data and provide intelligent advices to the user. It will provide user useful advices to invest their money in right place. By the construction and use of datawarehouse, the sales analysis will be simplified by just comparing the past performance with the current market scenario.

1. Introduction

The intended app solves the difficulty of a person by suggesting where to invest his money and also by reducing the need to go to the outside expert. In current existing systems, financial expert may charge fees and are also rarely available as there are not many experts in this field. This application will remove the need for human experts suggestion and will provide better, smarter, intelligent, more appropriate and more accurate advises to the user. Financial calculator is designed to do many financial calculations such as premiums for different insurance companies, tax calculations based on age and gender of the person and the current tax slabs and interest calculations for different banks at their rate of interest.

1.1. Features of a Stock Market

1.1.1. Stocks. The returns achieved from investing in shares in a stock market accrue partly from changes in the share price as capital gains and partly from dividends paid. Returns on shares are volatile and are consequently expected to be higher than for a safer investment such as risk free bonds. A key property of returns on shares is their apparent randomness. [2]

1.1.2. Equity. In finance, you can think of equity as ownership in any asset after all debts associated with that asset are paid off.
Example- A car or house with no outstanding debt is considered owners equity because he or she can readily sell them for cash. Stocks are equity because they represent ownership in a company. [2]

1.1.3. Bull and Bear Markets. The uses of bull and bear to describe market conditions have been derived from the manner in which each of these animals attack its opponent .A bull thrusts its horns up in to the air and a bear swipes its paws down. These actions are metaphors from the movement of a market. If the trend is up, it is considered as bull market and if the trend is down it is considered bear market. [2]

1.1.4. Sensex. Sensex is an index. An index is basically an indicator. It gives you a general idea about whether most of the stocks have gone up or most of the stocks have gone down. Sensex is an indicator of all the major companies of the BSE. If the sensex goes up it means the prices of the stocks of most of the major companies of the BSE have gone up. If the sensex goes down it means that the stocks price of most of the major stocks on the BSE have gone down. [2]

2. Financial Advisor

A financial adviser (or advisor) is a professional who renders financial services to clients. A financial advisor is generally compensated through fees, commissions, or a combination of both. A financial advisor may charge fees and are also rarely available as there are not many experts in this field. For example, a financial advisor may be compensated in one or more of the following ways:

- An hourly fee for advisory services.
- A flat fee, such as $500 per year, for an annual portfolio review or $2,000 for a financial plan.
- A commission on the securities bought or sold, such as $12 per trade.
- A commission (sometimes called a “load”) based on the amount invested in a mutual fund

or variable annuity. A "mark-up": when one buys "house" products (such as bonds that the broker holds in inventory), or a "mark-down" when they are sold.

- A fee for assets under management, such as 1% annually of assets managed.

The intended app solves the difficulty of a person by suggesting where to invest his money and also by reducing the need to go to the outside expert. [2]

3. Data Mining in Finance

With the increase of economic globalization and evolution of information technology, financial data are being generated and accumulated at an unprecedented rate. It is used to keep track of companies' business performance, monitor market changes, and support financial decision-making. Nonetheless, the rapidly growing volume of data has far exceeded our ability to analyze them manually. There is a critical need for automated approaches to effective and efficient utilization of massive financial data to support companies and individuals in strategic planning and investment decision-making. Data mining is able to uncover hidden patterns and predict future trends and behaviours in financial markets. It creates opportunities for companies to make proactive and knowledge-driven decisions in order to gain a competitive advantage. Data mining has been applied to a number of financial applications, including development of trading models, investment selection, loan assessment, portfolio optimization, fraud detection, real-estate assessment, and so on. The competitive advantages achieved by data mining include increased revenue reduced cost, and much improved marketplace responsiveness and awareness. Data mining aims to discover hidden knowledge and new rules from large databases that are potentially useful and ultimately understandable for making crucial decisions. It applies data analysis and knowledge discovery techniques under acceptable computational efficiency limitations, and produces a particular enumeration of patterns over the data. A financial professional can provide assistance on a range of financial issues from evaluating your insurance needs to helping you grow your assets.

Stock market returns: Data can be thought to fall into one of two categories as follows.

1. Five time series: index value at open, index value at close, highest index value, lowest index value and trading volume.
2. Fundamental factors: eg the price of gold. [4]

4. Artificial Intelligence in Financial Decision Making

An important goal of artificial intelligence is to devise machines to perform various tasks normally requiring human intelligence. Artificial Intelligence techniques are increasingly extending and enriching decision support through such means as analyzing data trends, providing forecasts, developing data consistency, quantifying uncertainty, anticipating the user's data needs, providing information to the user in the most appropriate forms, and suggesting courses of action. The application of artificial intelligence in financial decision making is not new. Artificial intelligence is being used in decision support for task such as aiding user to select actions in real time and stressful decision problems .It provides a dynamic response with the help of intelligent agents. The intelligent agents have some "intelligence" and make investment decisions based upon an information set. This system suggests and advises to financial help seeker based on domain specific expertise. [1], [3]

5. Design of the System

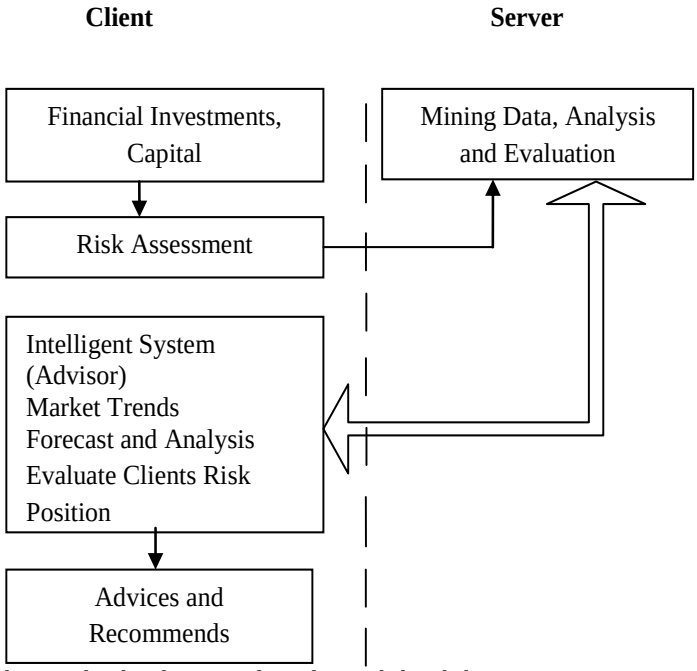

Fig 1: Block Diagram for Financial Advisor

As shown in Fig1, The user inputs the amount he wants to invests, number of years of investments, risk factor and his field of investment. According to the user's interest, data mining is done to fetch the current market

condition as well as historical data. This data is then processed and evaluated. The decision making process is done by the Intelligent System (i.e. Advisor). The Advisor checks the current and past market trends, evaluates client risks and the gives suggestion to the user

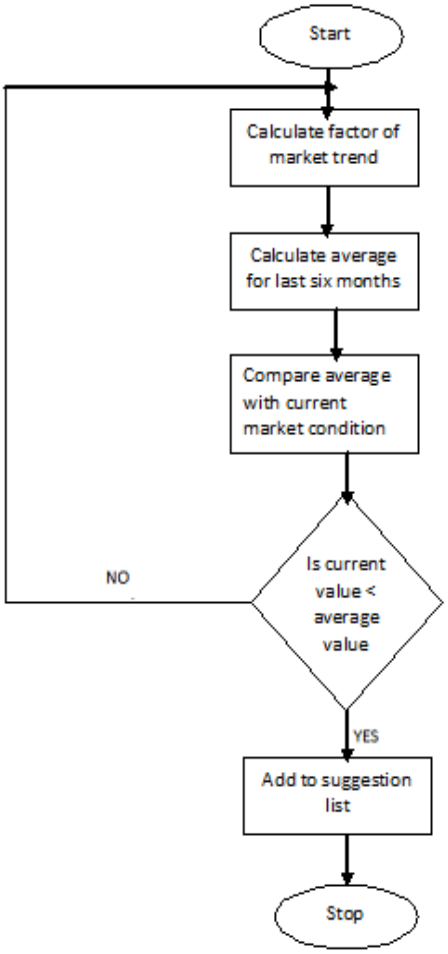

Fig2. Flow chart for Advisor

As shown in the above fig, the system will first analyze the historic data. For this analysis, it will consider the environmental factors which affect the Indian Stock Market. These are as follows:

1. PLR- PLR is the abbreviation of Prime Lending Rate. It is basically, the maximum interest rate that can be charged by the bank. As the PLR increases, the Stock value also increases and vice versa.

2. Gold Rate- Gold rates also affect the stock rates. If the gold rates increases, the stock market value decreases.

3. Rainy Season- Rainy season also have an effect on the Stock Market. If there is a good supply of rain, the agricultural yield is good, which in turn affects the export of the country. So if there is good and adequate supply of rain, the stock value increases else, decreases.

4. Natural Calamity- Natural Calamity also affects the stock market. If there occurs some natural calamity like earthquake, cyclones, droughts, etc. Then the stock value decreases.

5. Tension at the Border- If there is war with the neighbouring countries, then the stock value decreases.

6. Dollar Rate- As the dollar rate increases, the Indian stock value decreases.

7. Chinese Currency- As the Chinese currency rates increases, the stock value decreases.

8. Japanese Currency- If the Japanese currency rate increases, then the stock value decreases

To perform this analysis, we will make use of a scale which ranges from 0-5 i.e. low to high. Range 0-2 is considered as low range and 3-5 is considered as high range.

Fig. Rating Scale

	0	1	2	3	4	5
% Increase	-0.3	-0.2	-0.1	0	0.1	0.2
% Decrease	0.2	0.1	0	-0.1	-0.2	-0.3

For each stock, the average value per month is considered. The factors are given rating from 0-5. Depending upon the relationship of the factor with the stock market, the average value per month is incremented or decremented for that particular factor. The average value of all the 8 factors is then considered. This process continues for finding the average for 6 months. This average is then summed together and then divided by 6, to find its average value for the past six months. This average value is then compared with the current value. If the current stock value is less than the average value of the stock, then the corresponding stock will be added to the suggestion list.The past performance of stocks will be stored in a datawarehouse.This makes the decision making process easier and faster as we just have to compare the current market scenario with the past performance.

5. Conclusion

This was an attempt to devise an intelligent system that advises the user on their investment.
This application can be used by any investor or common people seeking investment advice on how and where to invest their money. This application can be further enhanced using more efficient algorithms and technique.

6. Future Work

This application can be further enhanced using more efficient algorithms and technique.
Recent and latest data mining tools and techniques can be used for further enhancement in features of the application. The best and most efficient heuristic algorithm can be used to improve the efficiency, accuracy and performance of the system.

7. References

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