A system for client management is disclosed. The system includes a churn prediction subsystem configured to predict a fall out condition of one or more clients based on current data of the one or more clients and historic data of the one or more clients using one or more prediction techniques. The system also includes a recommendation subsystem configured to generate at least one of one or more financial securities, or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique to retain the one or more clients in the financial broking system. The system further includes a visualization subsystem configured to display one or more insights to a user of the financial broking system generated by the churn prediction subsystem and recommender subsystem in one or more visual forms.


Declarations under Rule 4.17:
— as to the identity of the inventor (Rule 4.17(i))
— as to applicant’s entitlement to apply for and be granted a patent (Rule 4.17(H))
— as to the applicant’s entitlement to claim the priority of the earlier application (Rule 4.17(in))

Published:
— with international search report (Art. 21(3))
— in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE.
SYSTEM AND METHOD FOR CLIENT MANAGEMENT

This International Application claims priority from a provisional patent application filed in India having Patent Application No. 201721033402, filed on September 20, 2017 and titled "A SYSTEM AND METHOD FOR MANAGEMENT OF CLIENTS IN FINANCIAL BROKING SYSTEM".

BACKGROUND

Embodiments of a present disclosure relate to a data processing and more particularly to system and method for financial broking client management.

One of the major business problems for a financial brokerage firm is the clients going into undesirable business state where the revenue from the client is substantially reduced. One example of this is client going into trading inactivity state which is known as dormancy. There could be other client behaviour which may be undesirable for the brokerage firms from revenue point of view. Such phenomenon of clients going into an undesirable state may be called as churn. Client churn may negatively affect the brokerage revenue generation. In such situation, there is a necessity to know ahead of time when a client is likely to churn away so that necessary precautionary action may be taken to prevent such situation. The prediction of churn is called as Churn Prediction.

As organizations have control over the internal factors, therefore, it is easy to determine a remedy for the internal factors which contributing in churn. However, determining a remedy for external factors, on which the organization does not have control, is a difficult and a nontrivial task. Additionally, determining the influence of churned customers on existing customers remains a challenge.

Hence, there is a need for an improved system and method for financial broking client management to address the aforementioned issues.

BRIEF DESCRIPTION

In accordance with one embodiment of the present disclosure, a system for client management is provided. The system includes a churn prediction subsystem configured to predict a fall out condition of one or more clients in a financial broking system based on current data of the one or more clients and historic data of the one or more clients in the financial broking system using...
one or more prediction techniques. The system also includes a recommendation subsystem operatively coupled to the churn prediction subsystem. The recommendation subsystem is configured to generate at least one of one or more financial securities, or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique to retain the one or more clients in the financial broking system. The system further includes a visualization subsystem operatively coupled to the recommendation subsystem. The visualization subsystem is configured to display one or more insights to a user of the financial broking system generated by the churn prediction subsystem and recommendation subsystem in one or more visual forms, wherein the one or more insights includes a statistical data generated from the fall out condition of the one or more clients and at least one of the one or more financial securities and the one or more financial products recommendations.

In accordance with another embodiment of the present disclosure, a method for client management is provided. The method includes predicting a fall out condition of one or more clients in a financial broking system based on current data of the one or more clients and historic data of the one or more clients in the financial broking system using one or more prediction techniques. The method also includes generating at least one of one or more financial securities, or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique to retain the one or more clients in the financial broking system. The method further includes displaying one or more insights to a user of the financial broking system generated by the churn prediction subsystem and recommendation subsystem in one or more visual forms, wherein the one or more insights includes a statistical data generated from the fall out condition of the one or more clients and at least one of the one or more financial securities and the one or more financial products recommendations.

To further clarify the advantages and features of the present invention, a more particular description of the invention will follow by reference to specific embodiments thereof, which are illustrated in the appended figures. It is to be appreciated that these figures depict only typical embodiments of the invention and are therefore not to be considered limiting in scope. The invention will be described and explained with additional specificity and detail with the appended figures.
BRIEF DESCRIPTION OF DRAWINGS

The disclosure will be described and explained with additional specificity and detail with the accompanying figure in which:

FIG. 1 is a schematic representation of the client management system in accordance with an embodiment of the present disclosure;

FIG. 2 is a block diagram of an exemplary system for client management of FIG. 1 in accordance with an embodiment of the present disclosure; and

FIG. 3 is a flow chart representing the steps involved in a method for client management of FIG. 1 in accordance with an embodiment of the present disclosure.

Further, those skilled in the art will appreciate that elements in the figure are illustrated for simplicity and may not have necessarily been drawn to scale. Furthermore, in terms of the construction of the system, one or more components of the system may have been represented in the figure by conventional symbols, and the figure may show only those specific details that are pertinent to understanding the embodiments of the present invention so as not to obscure the figure with details that will be readily apparent to those skilled in the art having the benefit of the description herein.

DETAILED DESCRIPTION

For the purpose of promoting an understanding of the principles of the invention, reference will now be made to the embodiment illustrated in the figures and specific language will be used to describe them. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended. Such alterations and further modifications in the illustrated system, and such further applications of the principles of the invention as would normally occur to those skilled in the art are to be construed as being within the scope of the present invention.

It will be understood by those skilled in the art that the foregoing general description and the following detailed description are exemplary and explanatory of the invention and are not intended to be restrictive thereof.

The terms "comprises", "comprising", or any other variations thereof, are intended to cover a non-exclusive inclusion, such that a process or method that comprises a list of steps does not include only those steps but may include other steps not expressly listed or inherent to such a
process or method. Similarly, one or more devices or sub-systems or elements or structures or components preceded by "comprises... a" does not, without more constraints, preclude the existence of other devices, sub-systems, elements, structures, components, additional devices, additional sub-systems, additional elements, additional structures or additional components.

Appearances of the phrase "in an embodiment", "in another embodiment" and similar language throughout this specification may, but not necessarily do, all refer to the same embodiment.

Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by those skilled in the art to which this invention belongs. The system, methods, and examples provided herein are only illustrative and not intended to be limiting.

Embodiments of the present disclosure will be described below in detail with reference to the accompanying figures.

In the following specification and the claims, reference will be made to a number of terms, which shall be defined to have the following meanings. The singular forms "a", "an", and "the" include plural references unless the context clearly dictates otherwise.

Embodiments of the present disclosure relates to a system for financial broking client management. The system includes a churn prediction subsystem configured to predict a fall out condition of one or more clients in a financial broking system based on current data of the one or more clients and historic data of the one or more clients in the financial broking system using one or more prediction techniques. The system also includes a recommendation subsystem operatively coupled to the churn prediction subsystem. The recommendation subsystem is configured to generate at least one of one or more financial securities, or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique to retain the one or more clients in the financial broking system. The system further includes a visualization subsystem operatively coupled to the recommendation subsystem. The visualization subsystem is configured to display one or more insights to a user of the financial broking system generated by the churn prediction subsystem and recommendation subsystem in one or more visual forms, wherein the one or more insights comprises a statistical data generated from the fall out condition of the one or more clients and at least one of the one or more financial securities and the one or more financial products recommendations.

FIG. 1 is a schematic representation of the system (10) for client management in accordance with an embodiment of the present disclosure. The system (10) includes a churn prediction
subsystem (20) configured to predict a fall out condition of one or more clients based on current data of the one or more clients and historic data of the one or more clients in the financial broking system using one or more prediction techniques. In one embodiment, the current data and the historic data may include a plurality of trades executed, a plurality of stocks bought and sold, net worth, margin money in account and a demographic profile of the one or more clients. In some embodiment, the one or more prediction techniques may include a data processing technique, a data modelling technique and a data prediction technique such as a set of shallow and deep learning techniques, a recurrent neural networks technique and a random forests technique. The churn prediction subsystem (20) is also configured to identify one or more clients who are likely to churn in a specific time frame in future. In a specific embodiment, the churn prediction subsystem (20) may be configured to predict a dormancy state and a plurality of behavioural patterns of the one or more clients. As used herein, the term "dormancy" is defined as the state when the one or more client does not do any transactions or become inactive or does fewer than a specific number of transactions, within a defined period of time.

Furthermore, the system (10) includes a recommendation subsystem (30) operatively coupled to the churn prediction subsystem (20). The recommendation subsystem (30) is configured to generate at least one of one or more financial securities, or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique to retain the one or more clients in the financial broking system. As used herein, the term "financial securities" is defined as a term used to describe stocks, bonds, money market securities and other instruments representing the right to receive future benefits under a set of stated conditions.

In some embodiments, the at least one of the one or more financial securities or the one or more financial products recommendations may include a stock recommendation, a bond recommendation, a derivative recommendation and a Mutual Fund recommendation. In another embodiment, the recommendation subsystem (30) may also be configured to generate the one or more financial securities, and/or the one or more financial products recommendations based on additional data such as a plurality of historic investment trends among the one or more clients with similar investment patterns and a plurality of profiles of the one or more clients.

The system (10) further includes a visualization subsystem (40) operatively coupled to the recommendation subsystem (30). The visualization subsystem (40) is configured to display one or more insights to a user of the financial broking system generated by the churn prediction subsystem (20) and recommendation subsystem (30) in one or more visual forms. The one or
more insights comprises a statistical data generated from the fall out condition of the one or more clients and at least one of the one or more financial securities and the one or more financial products recommendations. In a specific embodiment, the one or more visual forms may include a graphical form or a textual form. In a preferred embodiment, the visualization subsystem (40) may include a mobile phone, a laptop, a tablet or a display interface.

FIG. 2 is a block diagram of an exemplary system (10) for client management of FIG. 1 in accordance with an embodiment of the present disclosure. A financial broking system is a platform used to trade financial securities. The financial broking system includes brokerage firms which facilitates the buying and selling of financial securities between a buyer and a seller. The brokerage firms of every size face challenges of churn among one or more clients. The system (10) for client management may predict churn of one or more clients such as sales agents. The system (10) includes a churn prediction subsystem (20) which is configured to receive structured data, which includes information relating to the one or more clients. In one embodiment, the structured data may include information related to the plurality of attributes, associated with each of the one or more clients. Further, the plurality of attributes may include a gender, a geography, an age, an annual billing amount, a type of service and a plurality of complaints.

Furthermore, the churn prediction subsystem (20) predicts one or more potential future chums for the financial broking client management based on the received structured data, current data and the historical data using one or more techniques such as a data processing technique, a data modelling technique and a data prediction technique. The data processing technique, the data modelling technique and the data prediction technique may include a set of shallow and deep learning techniques, a recurrent neural networks technique and a random forests technique. The churn prediction subsystem (20) is also configured to predict a dormancy state when the client does not do any transactions or become inactive or does fewer than a specific number of transactions. The churn prediction subsystem (20) is further configured to identify a plurality of behavioural patterns of the one or more clients which are unfavourable for the brokerage firms from the revenue generation point of view.

Moreover, the system (10) includes a recommendation subsystem (30) which is operatively coupled to the churn prediction subsystem (20). The recommendation subsystem (30) is configured to generate at least one of one or more financial securities, or one or more financial products recommendations based on one or more predicted potential future chums using a plurality of recommendation techniques such as a plurality of artificial intelligence techniques
and a plurality of machine learning techniques. The recommendation technique may include a collaborative filtering technique. In some embodiments, the at least one of the one or more financial securities or the one or more financial products recommendations may include a stock recommendation, a bond recommendation, a derivative recommendation and a Mutual Fund recommendation. Such financial recommendations are selected based on data analysis, statistical modelling, and prediction techniques. For the purpose of data analysis, statistical modelling and prediction, the recommendation subsystem (30) uses one or more of additional data such as historical investment trends among other clients with similar investment patterns and a plurality of profiles of one or clients as identified by the churn prediction subsystem (20).

In addition, the system (10) includes a visualization subsystem (40) which is operatively coupled to the recommendation subsystem (30). The visualization subsystem (40) is configured to display one or more insights to a user of the financial broking system generated by the churn prediction subsystem (20) and recommendation subsystem (30) in one or more visual forms such as a textual form or a graphical form. The one or more insights may include a statistical data generated from the fall out condition of the one or more clients and at least one of the one or more financial securities and the one or more financial products recommendations. The user of the financial broking system may be an owner of the brokerage firm or an authorized third-party agent. Such one or more insights are used by the relationship manager and other authorized agents of the brokerage firm.

In some embodiments, the system (10) may include a report generation subsystem (60) operatively coupled to the recommendation subsystem (20) and visualization subsystem (30). The report generation subsystem (60) is configured to generate a plurality of reports for the user of the financial broking system based on the one or more insights. In a specific embodiment, the plurality of reports may include a status of customer dormancy, stock recommendations for the one or more clients and mutual fund suggestion for the one or more clients. The visualization subsystem (40) and the report generation subsystem (60) are configured to send at least one of one or more insights or the plurality of reports to an interface (50) using one or more communication channels (70) at one or more locations, simultaneously or at different times. In a preferred embodiment, the interface (50) may include a mobile phone, a laptop, a tablet or a display interface. In a specific embodiment, the system (10) further includes an alert subsystem (80) configured to send a real time notification to the interface (50) upon detecting an unusual condition. The unusual condition may be a condition of moving a low probable churn client towards a high probable churn case.
FIG. 3 is a flow chart representing the steps involved in a method (200) for client management of FIG. 1 in accordance with an embodiment of the present disclosure. The method (200) includes predicting a fall out condition of one or more clients in a financial broking system based on current data of the one or more clients and historic data of the one or more clients in the financial broking system using one or more prediction techniques in step 210. In such embodiment, predicting the fall out state of the one or more clients in the financial broking system based on the current data of the one or more clients and the historic data of the one or more clients in the financial broking system using one or more prediction techniques may include predicting the fall out state of the one or more clients in the financial broking system based on the current data of the one or more clients and the historic data of the one or more clients in the financial broking system using a set of shallow and deep learning techniques, a recurrent neural networks technique and a random forests technique.

In some embodiments, the method (200) may include predicting a dormancy state and a plurality of behavioural patterns of the one or more clients. The method (200) also includes generating at least one of one or more financial securities, or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique to retain the one or more clients in the financial broking system in step 220. In such embodiment, generating at least one of one or more financial securities, or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique to retain the one or more clients in the financial broking system may include generating a stock recommendation, a bond recommendation, a derivative recommendation and a Mutual Fund recommendation using a plurality of artificial intelligence techniques and a plurality of machine learning techniques.

Furthermore, the method (200) includes displaying one or more insights to a user of the financial broking system generated by the churn prediction subsystem and recommendation subsystem in one or more visual forms in step 230. In a specific embodiment, displaying one or more insights generated by the churn prediction subsystem and recommendation subsystem on an interface in one or more visual forms may include displaying one or more insights generated by the churn prediction subsystem and recommendation subsystem on an interface in a graphical form or a textual form.

In one embodiment, the method (200) may include generating a plurality of reports based on the one or more insights. In some embodiments, the method (200) may further include sending
a real time notification to external computing subsystems upon detecting an unusual condition in the financial broking system.

Various embodiments of the system and method for financial broking client management described above enable efficient and integrated system and method that uses advanced techniques to identify potential churn ahead of time, recommend the corrective measure, and offer a system-level information and visualisation to the Relationship Manager or to others authorized agents of the firm.

It will be understood by those skilled in the art that the foregoing general description and the following detailed description are exemplary and explanatory of the disclosure and are not intended to be restrictive thereof.

While specific language has been used to describe the invention, any limitations arising on account of the same are not intended. As would be apparent to a person skilled in the art, various working modifications may be made to the method in order to implement the inventive concept as taught herein.

The figures and the foregoing description give examples of embodiments. Those skilled in the art will appreciate that one or more of the described elements may well be combined into a single functional element. Alternatively, certain elements may be split into multiple functional elements. Elements from one embodiment may be added to another embodiment. For example, order of processes described herein may be changed and are not limited to the manner described herein. Moreover, the actions of any flow diagram need not be implemented in the order shown; nor do all of the acts need to be necessarily performed. Also, those acts that are not dependent on other acts may be performed in parallel with the other acts. The scope of embodiments is by no means limited by these specific examples.
WE CLAIM:

1. A client management system (10) comprising:

   a churn prediction subsystem (20) configured to predict a fall out condition of one or more clients in a financial broking system based on current data of the one or more clients and historic data of the one or more clients in the financial broking system using one or more prediction techniques;

   a recommendation subsystem (30) operatively coupled to the churn prediction subsystem (20) and configured to generate at least one of one or more financial securities, or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique to retain the one or more clients in the financial broking system; and

   a visualization subsystem (40) operatively coupled to the recommendation subsystem (30) and configured to display one or more insights to a user of the financial broking system generated by the churn prediction subsystem (20) and recommendation subsystem (30) in one or more visual forms, wherein the one or more insights comprises a statistical data generated from the fall out condition of the one or more clients and at least one of the one or more financial securities and the one or more financial products recommendations.

2. The system as claimed in claim 1, wherein the current data and the historic data comprises a plurality of trades executed, a plurality of stocks bought and sold, net worth, margin money in account and a demographic profile of the one or more clients.

3. The system (10) as claimed in claim 1, wherein the one or more prediction techniques comprises a set of shallow and deep learning techniques, a recurrent neural networks technique and a random forests technique.

4. The system (10) as claimed in claim 1, wherein the churn prediction subsystem (20) is configured to predict a dormancy state and a plurality of behavioural patterns of the one or more clients.

5. The system (10) as claimed in claim 1, wherein the at least one of the one or more financial securities or the one or more financial products recommendations comprises a stock recommendation, a bond recommendation, a derivative recommendation and a mutual fund recommendation.
6. The system (10) as claimed in claim 1, wherein the one or more visual forms comprises a graphical form or a textual form.

7. The system (10) as claimed in claim 1, further comprising a report generation subsystem (60) operatively coupled to the recommendation subsystem (30) and visualization subsystem, wherein the report generation subsystem (60) is configured to generate a plurality of reports for the user of the financial broking system based on the one or more insights.

8. The system (10) as claimed in claim 1, further comprising an alert subsystem (80) configured to send a real time notification to an interface upon detecting an unusual condition in the financial broking system.

9. A method (200) comprising:

    predicting a fall out condition of one or more clients in a financial broking system based on current data of the one or more clients and historic data of the one or more clients in the financial broking system using one or more prediction techniques; (210)

    generating at least one of one or more financial securities, or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique to retain the one or more clients in the financial broking system; (220) and

    displaying one or more insights to a user of the financial broking system generated by the churn prediction subsystem and recommendation subsystem in one or more visual forms, wherein the one or more insights comprises a statistical data generated from the fall out condition of the one or more clients and at least one of the one or more financial securities and the one or more financial products recommendations. (230)

10. The method (200) as claimed in claim 9, further comprising generating a plurality of reports for the user of the financial broking system based on the one or more insights.
predict a fall out state of one or more clients in a financial broking system based on current data of the one or more clients and historic data of the one or more clients in the financial broking system using one or more prediction techniques

generate at least one of one or more financial securities or one or more financial products recommendations based on the fall out condition of the one or more clients in the financial broking system using a collaborative filtering technique

display one or more insights to a user of the financial broking system generated by the churn prediction subsystem and recommender subsystem on an interface in one or more visual forms, where the one or more insights includes a statistical data generated from the fall out condition of the one or more clients and at least one of the one or more financial securities and the one or more financial products recommendations.

FIG. 3
**INTERNATIONAL SEARCH REPORT**

**International application No.**

PCT/IB2018/057208

### A. CLASSIFICATION OF SUBJECT MATTER

G06Q30/00, G06Q10/00 Version=2.018.01

According to International Patent Classification (IPC) or to both national classification and IPC

### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Databases: TotalPatent One, IPO Internal Database

Keywords: client, manage, churn, prediction, recommend, finance

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

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**Date of the actual completion of the international search** 17-12-2018

**Date of mailing of the international search report** 17-12-2018

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