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Design And Development Of A Predictive Model For Foreign Exchange (Forex) Forecasting

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Abstract: The aim of this paper was to report on a system developed of predictive model for foreign exchange forecasting. The study developed an Improved Sentiment Analysis and Classification Systems using Ensemble of Predictive Experts in foreign exchange (FOREX) forecasting for accurate forecast and insight of Foreign Exchange trends used by investors. In addition, the study also intended to ensemble predictive experts such as Decision Tree, Regression Analysis and Neural Networks. The paper presents the procedure employed in the development process. The development process adopted Agile Software Development Method. Analysis and Classification System of the Predictive Expert system is presented. Based on the design, the paper recommends that the adoption of predictive experts such as deep neural networks, regression analysis, and decision tree technique must be modeled to a sentiment analysis system for accurate forecasting of FOREX signals.

Keywords—Foreign Exchange, Forecasting, Foreign Exchange Forecasting, Predictive Model

Introduction

The study considered specific risk issues associated with the Foreign Exchange (FOREX) market in Nigeria. Furthermore, foreign exchange investors are risk takers due to the decisions they often make on their resources for investment. Accurate forecasting of data has often been challenging to investors in the foreign exchange market due to lack of predictive and statistical tools. The mentioned challenge is also as a result of not applying models that accurately predict foreign exchange signals and trends. According to Bimi et al (2018), “the routine supervision of a project’s goal alongside the prediction on whether an investment goal can be achieved or not, can be described as investment monitoring and forecasting”.

The study intended to design and develop an Improved Sentiment Analysis and Classification Systems using Ensemble of Predictive Experts in foreign exchange (FOREX) forecasting for accurate forecast and insight of Foreign Exchange trends used by investors. Sentiment Analysis or Emotion Artificial Intelligence can simply be described as the application of Natural Language Processing (NLP) and Text Classification to the gaining of accurate and deep understanding of specific events. Classification system is the process of identifying opinions in text and labeling them as positive, negative, or neutral, based on the emotions using natural language processing (NLP) to predict accurate results. In addition, the study also intended to ensemble predictive experts such as Decision Tree, Regression Analysis and Neural Networks.

A Decision Tree can be defined as an expert system tool used for analyzing multiple variables. Decision Trees segment information into groups that are based on the variable input. This will help a user assimilate the concept of decision-making. Regression Analysis can be defined as a statistic-related way that shows relationship among variables. Also, regression analysis can be adopted for inspection of variables strength. A Neural Network is a system that is patterned after the operation of the human brain, and is used to solve complex pattern recognition problems.

The Concept of Foreign Exchange, Money serves as a medium of exchange, simplifying transactions between millions of people in a market place. It is simply anything of value that the general public accepts for the purpose of making transactions and settling debts. Money is primarily used as a medium of exchange and is crucial in the settlement of financial obligations. Money is commonly referred to as currency (notes or coins) because it is easily used to make payments. That is why the terms money and currency are used interchangeably. Money, on the other hand, is more than just currency in that it includes other items used for transaction (Mbutor et al., 2016). Different mediums of exchange are used in transactions between people who live in different countries. Cross-border transactions typically necessitate the exchange of one currency for another (foreign exchange or FOREX or exchange rate). The price of one currency in terms of another is described by an exchange rate. As a result, the term FOREX is an acronym for foreign exchange. FOREX simply

refers to how currencies are valued and interpreted when a transaction occurs between two or more countries. It also refer to as exchange rate, according to Kabari & Maccarthy (2019), the exchange rate reveals the proportion at which one currency can be exchanged for another, which is the currency price ratio. It is the exchange rate of a foreign country's currency versus the rate of the home country's currency. It also specifies the value of one currency in relation to another. The exchange rate has been one of the most important factors influencing the economic growth of most advanced countries; however, a regular random walk or unstable exchange rate is a major impediment to the economic growth of many countries, including Nigeria.

Development

The method adopted by the study for the proposed system design is Agile Software Development Method. Agile software development refers to software development methodologies centered round the idea of iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams. The ultimate value in agile development is that it enables teams to deliver value faster, with greater quality and predictability, and greater aptitude to respond to change. Scrum and Kanban are two of the most widely used agile methodologies. The study intends to approach the Scrum type of the Agile Software Development Method. Furthermore, the Agile method generally promotes a disciplined project management process that encourages frequent inspection and adaptation, a leadership philosophy that encourages teamwork, self-organization and accountability, a set of engineering best practices intended to allow for rapid delivery of high-quality software, and a business approach that aligns development with customer needs and company goals. Agile development refers to any development process that is aligned with the concepts of the Agile Manifesto.

Agile Scrum

The Agile Scrum process is distinguished from other agile processes by specific concepts and practices, divided into the three categories of Roles, Artifacts, and Time Boxes. These and other terms used in Scrum are defined below. Scrum is most often used to manage complex software and product development, using iterative and incremental practices. Scrum significantly increases productivity and reduces time to benefits relative to classic “waterfall” processes.

In the machine learning process, the Scrum process implements a sprint which is a key unit of iterative development which runs for approximately 2–4 weeks and includes all of the activities depicted indicated in Fig. 3.1. A typical sprint allows for access to raw data from a new or existing data source, perform feature ideation and engineering, and then re-train and test the machine learning model before deploying it to an endpoint or performing batch scoring. The accuracy of the model at the end of the sprint is less important than the accuracy improvement over the previous sprint (Dougherty, 2019).

Sprint 0, which is the first sprint has a slightly different structure because it focuses on laying the groundwork for future sprints. The data scientist will create the feature engineering and model training pipeline during Sprint 0. This is greatly accelerated if the data scientist has access to a "machine learning workbench" of some kind, which already has access to data sources and software or packages for model development. Sprint 0 is also the point at which most relevant candidate algorithms most appropriate for the data types and business stakeholders are selected. The second level is the Sprint review which entails the development team providing an update review to stakeholders of the recent engineered features, an update on model accuracy, and progress toward the business outcome are among the topics covered. This gives an excellent opportunity to review an updated feature importance ranking which shows which inputs and start building trust in the product. Finally the backlog refinement process is performed before each sprint, as the team will re-prioritize the backlog based on the results of the previous sprint. This is an opportunity to solicit feedback from cross-functional stakeholders on the benefits of various data sources and the challenges of integration.(Guiza, 2018; Dougherty, 2019).

Fig.3.1 shows the diagrammatic illustration of the Agile Software Development Method. In addition, the study will keenly follow the steps of the adopted method.

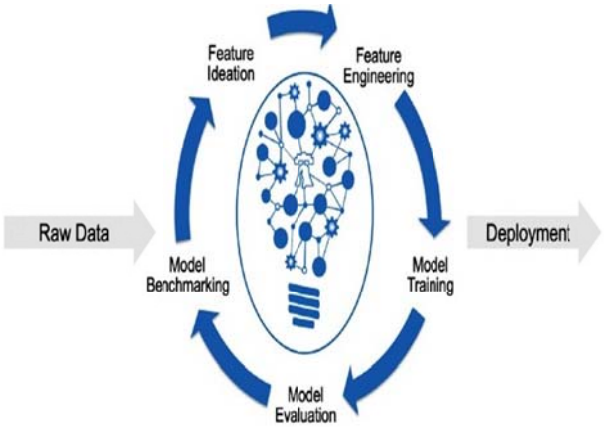
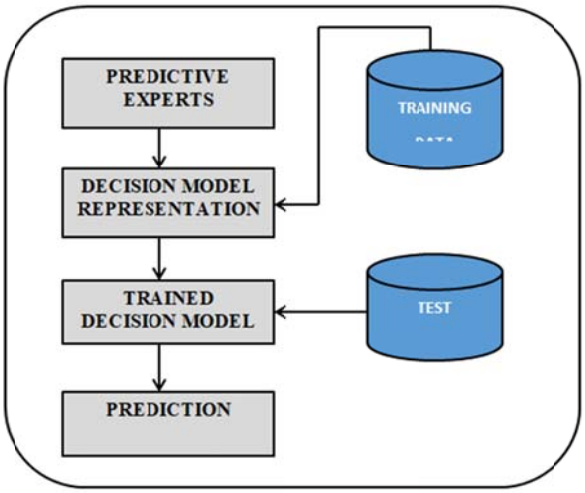


Figure 3.1: Structure of Agile Machine Learning Sprint (Source: Dougherty, 2019)

Analysis of the Existing System

The existing system depicted in Fig.3.2 addressed by the study is a model for predictive techniques and methods for decision support in situations with poor data quality. The model was designed to proffer accurate solutions and methods to information mining systems. The adopted predictive techniques and methods used in developing the model encompassed

information fusion, ensemble and rule extraction. Furthermore, the rule extraction is performed to facilitate decision support for manual adjustments of predictions with high uncertainty. In this way the ensemble can be used in spite of insufficient global performance and the need of manual adjustments are minimized. Information fusion is about fusing information from different sources in order to facilitate understanding or providing knowledge that is not evident from the individual sources. Closely related terms (or research areas) are data mining and knowledge discovery, two terms commonly used from an artificial intelligence (AI) perspective for the extraction of regularities from large data sets. Information fusion not only deals with actual fusion processes, but also with how the results of these processes can be used to improve decision-making. The predictive expert deployed in the existing system is depicted in Fig.3.3



3.2: Existing System Architecture of a Decision Model using Predictive Experts Technique (Source: Konig, 2020)

Predictive Expert Deployed in Existing System

The process of deployed the knowledge base from a given input to output using Predictive Expert systems fig.3.3.The knowledge base which Identity Resolution Rule base covers the rules that describe the model in how the system extra data from the rule base model and database model, Rule base model implementation those rules that take place during modeling in the data preprocessing and predictive analytics. Data preparation tasks are performed multiple times and not in every prescribed order. In-database mining capabilities integrated with these workflows can push data preparation, transformation and even modeling algorithms into an organization's data infrastructure, improving throughput by reducing data movement. Inference Engine it control structure (rule interpreter) and provides system for reasoning. It acts as an interpreter that analyzes and processes the directions. It is used to perform the task of matching antecedents from the responses given by the users and firing rules. In-memory and other high performance analytic capabilities as well as intelligent automation of modeling activities can be applied as appropriate in the steps defined in the workflows. Predictive analytics is the use of advanced analytic techniques that leverage historical data to find real time insights and to predict and forecast accurate result automatically.

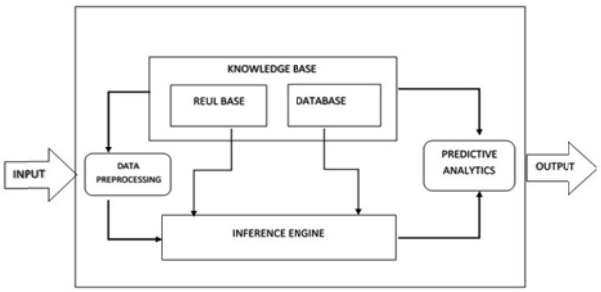


Figure 3.3: Predictive Expert Deployed in Existing System (Source: Konig, 2020)

Description of the Existing System Components

The existing system comprise the following components.

Predictive Experts: This component represents tools used for predictive analytics before decision is reached. Predictive analytics is the use of advanced analytic techniques that leverage historical data to uncover real-time insights and to predict future events. For the first time, organizations of all sizes can have the tools to embed predictive analytics into their business processes and to harness AI at scale.

Decision Model Representation: This component represents an intellectual template for perceiving, organizing, and managing the business logic behind a business decision. Regardless, it is these business rules or statements (more accurately, their intended logic) that are modeled in a Decision Model structure adhering to the Decision Model principles.

Training Data: This component represents a process used to help a program understand how to apply technologies like neural networks to learn and produce sophisticated results. Training data is also known as a training set, training dataset or learning set.

Trained Decision Model: This component represents the programmed automation of then decision model by algorithms and neural networks.

Test Data: This component represents a testing process specifically identified for use in tests, typically of a computer program. Some data may be used in a confirmatory way, typically to verify that a given set of input to a given function produces some expected result.

Prediction: This component represents an estimation made from observations

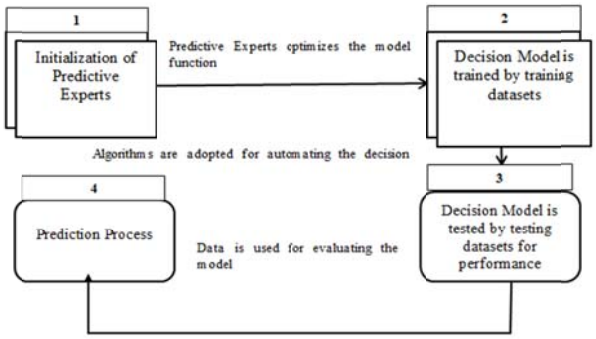


Figure 3.4: Data Flow Diagram of the Existing System (Source: Konig, 2020)

Step 1:	Start
Step 2:	Initialize Predictive Experts for Decision Model
Step 3:	Extract Techniques for Prediction (TFP)
Step 4:	TFP = Ensemble + Information Fusion + Rule Extraction
Step 5:	Train Decision Model with TFP
Step 7:	Initialize Test-Sets (TS) for Decision Model Prediction
Step 8:	Test Decision Model Prediction with TS
Step 9:	Alert Decision Model Prediction as Output
Step 10:	Stop

Figure 3.5: Algorithm of the Existing System (Source: Konig, 2020)

```
Start
Initialize Program
Declare TFP, DM, TS
TFP; Techniques for Prediction', DM; Decision Model', TS; Test-Set',
Read (*,*)'TFP'
Read (*,*)'DM'
Read (*,*)'TS'
Input TS for DM
//Increment TS
TS = TS + 1;
Write (*,*)'DM'
End
```

Figure 3.6: Pseudocode of the Existing System (Source: Konig, 2020)

Disadvantages of the Existing System

The existing system framework developed by Konig (2020) has the following disadvantages:

i) Decision errors due to the lack of sentiment analysis predictive experts such as decision tree, regression analysis and deep neural networks. In other words, a foreign investor that adopts the existing system for investment will be prone to forecast and decision errors.

ii) Consequently, it's difficult to analyze intangible or indefinable data using the Existing System as a decision tool. In reality, some values cannot be very specific and defined in numbers. Even though the Existing System may quantify some of these aspects, the end result must be duly considered by the decision makers. They must use their own judgment when making the final decision.

Design of the Proposed System

This section describes the process of defining components, modules, interfaces, and datasets for a system to satisfy specified requirements. In addition, it is also the process of creating or altering systems, along with the processes, practices, models, and methodologies used to develop them.

Tools for Designing the Proposed System

The proposed system deploys an ensemble machine learning algorithm for the classification process of the sentiment analysis system using decision tree, regression analysis and neural network respectively. The output of the ensemble is further passed into the predictive expert for further classification and analysis respectively. Figure 3.8 illustrates the architecture of the proposed system showing the implementation of sentiment analysis ensemble for the optimization of the model.

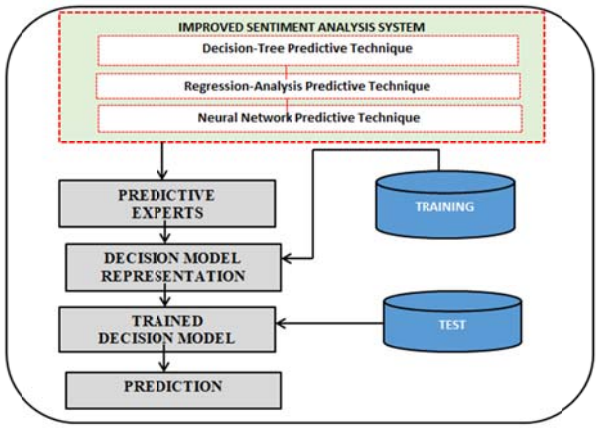


Figure 3.7: Proposed System Architecture

Predictive Technologies used in the Study

The improved sentiment analysis system is a combination of three machine learning predictive technologies used for enhancing the existing systems as illustrated in the proposed system architecture in Fig. 3.8 and 3.9. The different component of the sentiment analysis system is an ensemble which combined decision tree, regression analysis and neural network predictive techniques respectively. It is important to note that combining several predictive technologies can improve prediction accuracy on unseen data and reduce generalization error. At the same time, because a combination process or ensemble techniques defines a collection of models, it is extremely difficult to express the overall relationship found in the original variables. Using an ensemble is thus a choice of a black-box model that prioritizes accuracy (Konig, 2020).

Decision Tree

The decision tree is a machine learning predictive technique that is relatively train faster with very

efficient predictive accuracy. In this classification problem, the root node is evaluated first base on the probabilistic result obtained from the train dataset. The proposed system nodes contain various assumptions about the state of a technical indicator with some additional feature that enhance the prediction of the current market state, and the truth or falsity of these assumptions is determined in both branches. This algorithm generates the most "trained" trading decision tree based on daily historical data of the indicators that depict High or Low as the final prediction of the tree processing. This extends the usefulness of the rule because the level ranges are recalculated on regular basis and therefore reflecting the most recent market state.

The decision tree accepts three variables: Moment; Period; and Sample data in a predefined range and compute the Means Square Error (MSE) and the bias (i.e. the lost function) as value. The data simulation flows through some processing levels which given an acceptable gradient and predict High or Low as the direction of the prediction signal that depend on the simulation probability as shown in Fig.3.8.

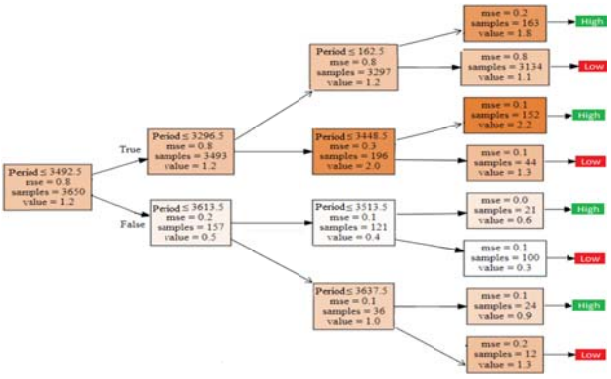


Figure 3.8 Decision Tree Showing Trade Decision Signal (Satriyo, et al., 2014)

Regression Analysis

Regression analysis is the process of estimating the relationship between a dependent variable and independent variables. Primarily it means fitting a function from a chosen family of functions to the sampled data while accounting for some error function. Anwar (2020), opines that it is one of the most fundamental prediction tools in the field of machine learning. Regression involves fitting a function to the available data and attempting to predict the outcome for future or hold-out data points. Regression analysis being a statistical model for the determination of relationship between one or two independent variables or predictor and a dependent variable or criterion receives the output from the decision tree, analyses it and produces a predicted value for the criterion as a result of the predictors' linear combination. The output from the regression analysis predictive techniques will be fed into the neural network component. In fitting the function it serves for both interpolation and extrapolation processes which entails estimation of missing data within the data range and estimating future data outside the data range. The regression model can be expressed mathematically as follows;

Estimate a function $f_\beta(.)$ Parameterized with β given the data points $(x_i, y_i) \forall_i \in \{0,1,.,n-1\}$

$$\text{under a loss function } \sum_{.i} l(f(x_i), y_i) \text{ Eqn 3.1}$$

Using linear regression whose objective is to fit the hyper plane by minimizing the sum of the mean square error for each of the data point we represent it mathematically as;

Given P data points (x_i, y_i)

where, $(x_i, y_i) \in \mathbb{R} \forall_i \in \{0,1,.,P-1\}$

fits the linear function $y = f_\beta(x) = \beta_0 + \beta_1 x$

and by minimizing this we have $min_\beta \sum_p \text{II}\, y^p - f(x^p) \text{II}^2$ Eqn 3.2

Here we discover two variables represented by β that parameterize the linear function $f(.)$

Neural Network Data Leaning

The artificial neural network (ANN) is a mathematical modeling technique similitude of the human brain and it made up of multiple layers which include the input, hidden and output layers used to solve optimization problems. ANN is a technique that works well with few assumptions and can tolerate noisy and nonlinear data, making it an excellent choice for financial time series data. The neural network component of the propose system sentiment analysis is a machine learning model designed to predict expectation from given data. Thus, it accepts set of data and process it in layers that link in vertical column-wise that pass signals between the units' layers.

The propose model as shown in Fig. 3.9 accept four data set in time, period, expectation and currency which are grouped into train and evaluation data. The train data are further group into train and test data set. The proposed neural network outputs are High and Low. High is in favor of increase in the currency exchange rate while Low in favor of currency decrease in exchange rate respectively. The variable adopt in the propose system neural network are in accordance with foreign exchange. Thus, Moment is the instance record of expected actual result; the Period is the interval in second considers for a particular expectation, Expectation is the actual result at a given moment and Currency is the money been trade on at that moment.

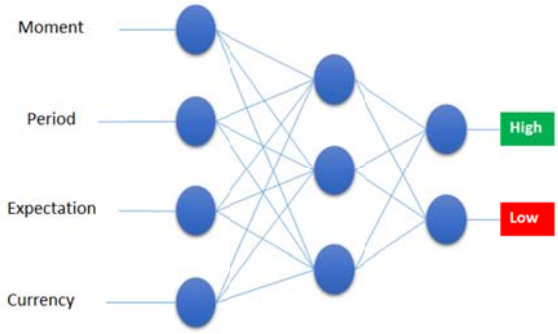


Figure 3.9 Artificial Neural Network (Satriyo, et al., 2014)

Ensemble Model of the Improved Sentiment Analysis and classification system

The ensemble model of the Improved Sentiment Analysis and classification system fig.3.10, the architectural model depict the process flow diagram in the component. The input data accept dataset as an input system and passing it in to ensemble model is a process which use in multiple diverse base models which is used to predict an outcome, the ensemble model is to reduce error in the prediction process. The data preprocessing, training dataset, and test dataset work in synergy and accept input dataset and in to decision tree which is a machine learning predictive technique that is relatively train faster with very efficient predictive accuracy, regression analysis that ensure the estimation of the relationship between a dependent variable and independent variables, while the neural network performance the mathematical modeling technique similitude of the human brain and it made up of multiple layers which include the input, hidden and output layers used to solve optimization problems, the model combining the predictions to predict the final the forecasting.

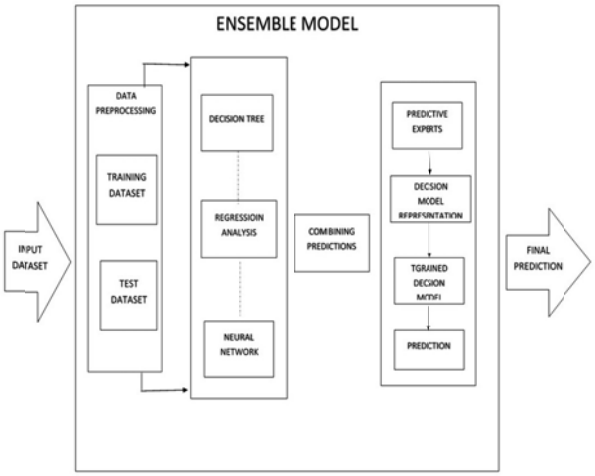


Figure 3.10: Ensemble Model of the Improved Sentiment Analysis and Classification System

Analysis and Classification System of the Predictive Expert

The process flow of the proposed system shows the flow of operation in the proposed system fig.3.11, staring from the ensemble sentiment analysis component which comprises of the decision tree, regression analysis and neural network model. The ensemble component which undertakes the initial classification of the dataset does the classification and predictive function and passes it to the predictive expert and so on.

The sentiment analysis ensemble combines the stated model thereby improving the prediction accuracy on unseen data to reduce generalization error. The predictive expert component represents the tools used for predictive analytics prior to making a decision. Predictive analytics is the application of advanced analytic techniques to historical data in order to uncover real-time insights and predict future events. For the first time, organizations of all sizes will be able to embed predictive analytics into their business processes and leverage AI at scale. Because the decision model representation is a mental template for recognizing, organizing, and managing the business logic behind a business choice. They are modeled in a Decision Model structure that adheres to the Decision Model principles. The trained decision component prior to prediction enable the model to learn how to apply technologies like neural networks and produce sophisticated results, a program uses this component as a guide. In addition to the term "training data," other terms for it include "training dataset" and "learning dataset." Finally, the prediction component represents estimation made from observations.

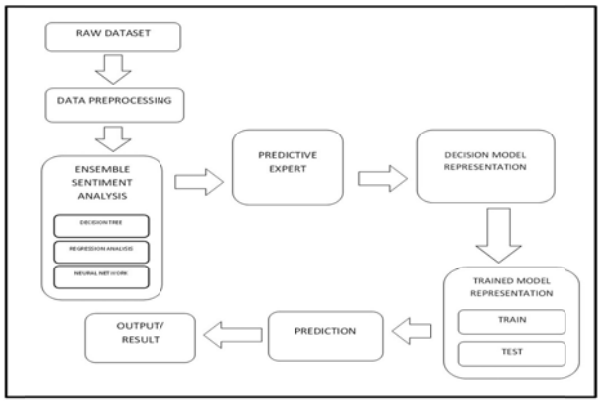


Figure 3.11 Analysis and Classification System of the Predictive Expert system

Mathematical Model of the Proposed System

Development of mathematical approaches for sentiment analysis and classification systems using ensemble of predictive experts. Fig 3.12 with regression analysis, decision tree and neural network in Forex forecast to solving this problem: model base, model development environments, model management system, data management interface management, model directory, model execution environment, knowledge management, interface management and solvers. The development of foreign

forecast it determine the strength of signal of which the sentiment of the exchange of currency is could be low or high using the ensemble expert knowledge prediction. The mathematical model plays a vaster role in the development of regression analysis, decision tree and neural network prediction; they interact with each other and performance automatic prediction.

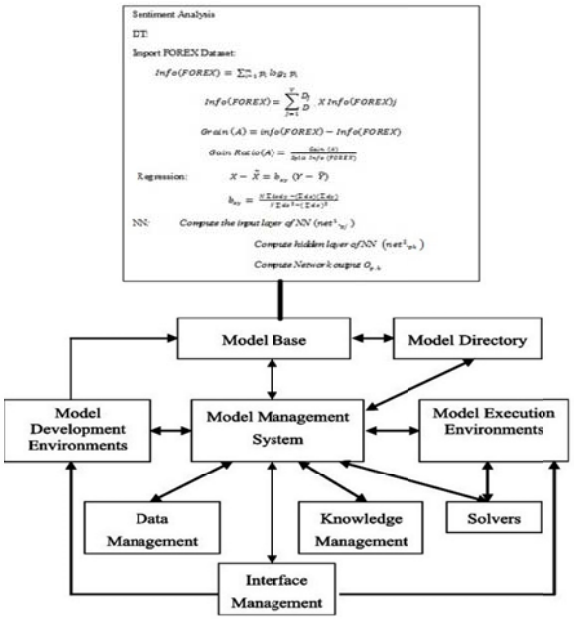


Figure 3.12 Mathematical Model of the Proposed System

Activity Diagram of the Proposed System

Fig.3.7.Shows the Proposed System Activity Diagram. Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams are intended to model both computational and organizational processes (i.e., workflows), as well as the data flows intersecting with the related activities. Although activity diagrams primarily show the overall flow of control, they can also include elements showing the flow of data between activities through one or more data stores. Activity Diagrams describe how activities are coordinated to provide a service which can be at different levels of abstraction. Typically, an event needs to be achieved by some operations, particularly where the operation is intended to achieve a number of different things that require coordination, or how the events in a single use case relate to one another, in particular, use cases where activities may overlap and require coordination. It is also suitable for modeling how a collection of use cases coordinate to represent business workflows.

Furthermore, the basic purposes of activity diagrams are similar to other four diagrams. It captures the dynamic behavior of the system. Other four diagrams are used to show the message flow from one object to another but activity diagram is used to show message flow from one activity to another. Activity is a particular operation of the system. Activity diagrams are not only used for visualizing the dynamic nature of a system, but they are also used to construct the executable system by using forward and reverse engineering techniques. The only missing thing in the activity diagram is the message part. It does not show any message flow from one activity to another. Activity diagram is sometimes considered as the flowchart. Although the diagrams look like a flowchart, they are not. It shows different flows such as parallel, branched, concurrent, and single.

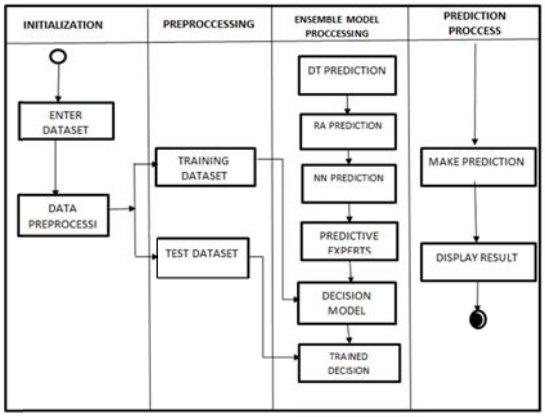


Figure 3.13 Activity Diagram of the Proposed System

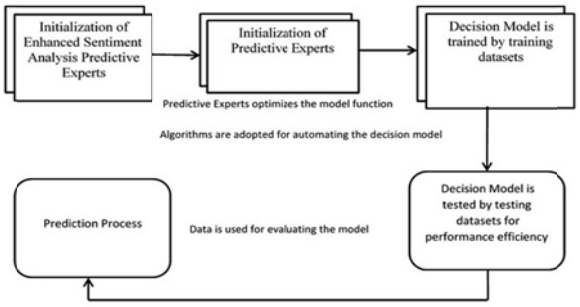


Figure 3.14 Data Flow Diagram of the Proposed System

Step 1: Start
Step 2: Initialize Enhanced Sentiment Analysis Predictive Expert;
Step 3: Decision-Tree, Regression Analysis and Neural Network
Step 4: Initialize Predictive Experts for Decision Model
Step 5: Extract Techniques for Prediction (TFP)
Step 6: TFP = Ensemble + Information Fusion + Rule Extraction
Step 7: Train Decision Model with TFP
Step 8: Initialize Test-Sets (TS) for Decision Model Prediction
Step 9: Test Decision Model Prediction with TS
Step 10: Alert Decision Model Prediction as Output
Step 11: Stop

Figure 3.15 Algorithm of the Proposed System

```
Step 1:  Start
Step 2:  Initialize Predictive Experts Breakdown
Step 3:  Input set of classes for Decision Tree
Step 4:  Initialize Terminal Node (TN)
Step 5:  Load Test-Sets for TN
Step 6:  Increment
Step 7:  TN = TN + 1
Step 8:  Contribute Decision Tree to Forex Prediction
Step 9:  Initialize Predictive Experts Breakdown
Step 10: Input set of classes for Regression Analysis (RA)
Step 11: Initialize RA
Step 12: Load Test-Sets for RA
Step 13: Increment
Step 14: RA = RA + 1
Step 15:Contribute Regression Analysis to Forex Prediction
Step 16: Initialize Neuro-Fuzzy Logic
Step 17: Test Neuro-Fuzzy Logic
Step 18: Initialize Load Management Repository (LMR)
Step 19:LMR = 0
Step 20: Increment LMR
Step 21:LMR = LMR + 1
Step 22: Initialize Resource Arbiter of Predictive Experts
Step 23: refactoring_count = 0
Step 24: repeat
Step 25:update system output
Step 26:end
```

Figure 3.16 Algorithmic Breakdown of the Applied Predictive Experts

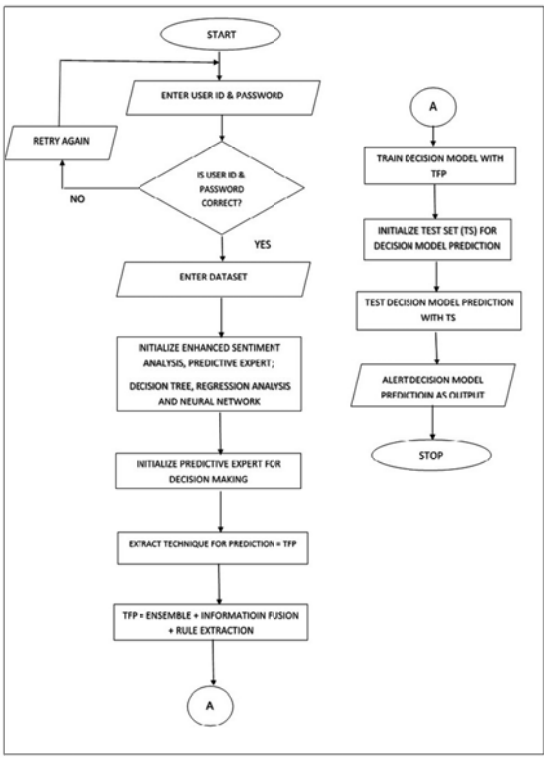


Figure 3.17 Flowchart of the Proposed System

```
Start
Initialize Program
Declare DT, RA, NN
DT; Decision Tree,' RA; Regression Anilysis', NN; Neural Network',
Read (*,*)'DT'
Read (*,*)'RA'
Read (*,*)'NN'
Declare TFP, DM, TS
TFP; Techniques for Prediction', DM; Decision Model', TS; Test-Set',
Read (*,*)'TFP'
Read (*,*)'DM'
Read (*,*)'TS'
Input TS for DM
//Increment TS
TS = TS + 1;
Write (*,*)'DM'
```

Figure 3.18 Pseudocode of the Proposed System

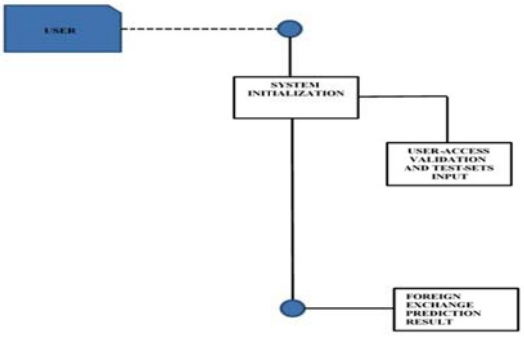


Figure 3.19 Activity Model of the Proposed System

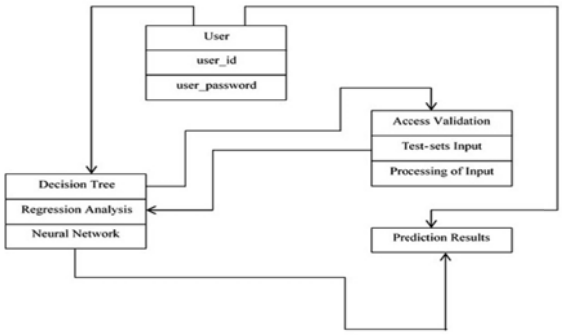


Figure 3.20 Data Model of the Proposed System

Tables 3.1, 3.2 and 3.3 show the output and input specifications and database design

Table 3.1: Output Specification

Field Name	Field Type	Field Size	Null	Default
First_Name	Varchar	30	No	None
Last_Name	Varchar	30	No	None
DoB	Date (mm/dd/yy)	6	No	None
Address	Varchar	100	No	None
Mobile	Varchar	12	No	None
Gender	Varchar	6	No	None
Email	Varchar	20	No	None
Username	Varchar	10	No	None
Password	Varchar	20	No	None
Foreign Exchange Test-Sets	Varchar	10	No	None
Results of Prediction	Varchar	10	No	None

Table 3.2: Input Specification

Field Name	Field Type	Field Size	Null	Default
First_Name	Varchar	30	No	None
Last_Name	Varchar	30	No	None
DoB	Date (mm/dd/yy)	6	No	None
Address	Varchar	100	No	None
Mobile	Varchar	12	No	None
Gender	Varchar	6	No	None
Email	Varchar	20	No	None
Foreign Exchange Test-Sets	Varchar	10	No	None

Table 3.3: Database Design Details

Field Name	Data Type	Description	Field Size	Missing Value	Alignment
First_Name	Varchar	First Name of user	30	None	Center
Last_Name	Varchar	Last Name of user	30	None	Center
DoB	Date(mm/dd/yy)	Date of Birth of user	6	None	Center
Address	Varchar	Residential Address of user	100	None	Center
Mobile	Varchar	Phone Number of user	12	None	Center
Gender	Varchar	Gender description of user	6	None	Center
Email	Varchar	Email of user	20	None	Center
Username	Varchar	Username of user	10	None	Center
Password	Varchar	Corresponding Password of user	20	None	Center
Foreign Exchange Test-Sets	Varchar	Information for forecasting the foreign exchange market	10	None	Center

Advantages of the Proposed System

The newly developed system will ensure accurate decision making in the foreign exchange market via an ensemble of efficient predictive experts. Furthermore, the proposed system enables all processes concerning data modification before modeling to be known. In addition, the proposed system adopts a cross validation technique when forecasting data. The mentioned technique is a more systematic approach to random subsampling. Instead of choosing the holdout set randomly several times, each instance is randomly assigned to one of k equal sized subsets or folds before training. Next, k models are trained each using one of the folds as test set and the other k-1 folds as training so that each fold is used as a test set once. In this way cross validation utilizes all instances and each instance is used once for testing and k-1 times for training.

Summary/Conclusion

The study exhaustively analyzed the role of sentiment analysis in forecasting foreign exchange signals in the international trade market. Furthermore, sentiment analysis is contextual mining of text which identifies and extracts subjective information in source material, and helping a business to understand the social sentiment of their brand, product or service while monitoring online conversations. However, analysis of social media streams is usually restricted to just basic sentiment analysis and count based metrics. This is akin to just scratching the surface and missing out on those high value insights that are waiting to be discovered. Forex sentiment analysis is the process of identifying the positioning of traders, whether net long or net short, to influence your own trading decisions in the currency market. With the recent advances in deep learning, the ability of algorithms to analyze text has improved considerably. Creative use of advanced artificial intelligence techniques can be an effective tool for doing in-depth research.

We believe it is important to classify incoming forex trader conversation about signals that are best for forex investment. Sentiment Analysis is the most common text classification tool that analyses an incoming message and tells whether the underlying sentiment is positive, negative our neutral. Sentiment analysis is a type of text research aka mining. It applies a mix of statistics, natural language processing (NLP), and machine learning to identify and extract subjective information from text files, for instance, a reviewer's feelings, thoughts, judgments, or assessments about a particular topic, event, or a company and its activities as mentioned above. This analysis type is also known as opinion mining (with a focus on extraction) or affective rating.

Recommendations

In order to ensure confidence in making accurate FOREX investment decisions, the study recommended that the adoption of predictive experts such as deep neural networks, regression analysis, and decision tree technique must be modeled to a sentiment analysis system for accurate forecasting of FOREX signals.

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