

A Framework for Improving Key Performance Indicators using Business Intelligence Techniques

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Abstract:- The study aims to identify the most important factors affecting the main performance indicators in business intelligence inside Business Organizations, by classifying them according to the degree of impact on them.

The Data mining methods help to extract the hidden relation between the data in order to analyze, and then predict information from large databases. One of the most important tools used in data mining is called neural networks. It works through learning and prediction. The higher the input values, the greater the learning process because it depends on training.

Keywords:- Business Intelligent, Data Mining, Knowledge Discovery, Key Performance Indicators.

I. INTRODUCTION

Dashboards are regularly made out of data display technology, including Key Performance Indicators (KPIs) which assume an essential part in rapidly giving precise data by looking at current execution against an objective needed to fulfil business targets. In any case, KPIs are not in every case notable and in some cases Hard to find a proper KPIs to connect with every It aims to work [11].

Business Intelligence frameworks Grants verifiability and current views of any business activity, we find a lot of information used and collected as a whole in the data warehouse and work intermittently with any information during the operation process. The components of the Software elements support the preparation of reports Interactive pivot table analytics and also mining for measurable information [12].

It provides processing applications, whether sales, production, finance, and various other sources of business data, and its purpose includes business performance management.

Data is accumulated regularly about different organizations in a similar industry and known as performance measurement.

II. BUSINESS INTELLIGENCE CONCEPTS

A. Definition

Business intelligence (BI) alludes to the procedural and technical foundation that gathers, stores and analyzes the data delivered by an organization's activities. Business insight is a wide term that incorporates information mining, measure examination, execution benchmarking, engaging investigation, etc. Business insight is intended to take in all the information being created by a business and present simple to process execution measures and patterns that will illuminate the executive's choice [6].

B. Tasks

The expected advantages We find that all elements and tools of business intelligence aim to provide and improve decision-making, simplify and speed up internal processes and add an increase operational productivity, driving new incomes and gaining competitive advantage over business rivals.

BI frameworks can likewise assist organizations with distinguishing market patterns and spot business issues that should be tended to [12].

Business Intelligence frameworks give authentic, current, and predictive perspectives on business activities, frequently utilizing information that has been accumulated into data warehouse or data mart and sometimes working from operational data [5]. Programming components uphold announcing, intuitive "cut up" turn table investigations, perception, and factual information mining. Applications tackle deals, creation, monetary, and numerous different wellsprings of business information for purposes that incorporate business execution the executives. Data is regularly accumulated about different organizations in a similar industry which is known as benchmarking [14]. BI information the stored data warehouse includes historical information, like the new and modern information that is collected when it is created from the source of the frameworks, to enable the tools used in Business Intelligence to provide support for all major, strategic and dynamic processes.

III. DATA MINING CONCEPTS

A. Definition

Data mining to enhance decision-making through a range of computer technologies and applications, this will be by applying prediction and description methods to a large amount of data to increase decision-making ability, increase accuracy, reduce analysis time, reduce poor performance indicators used, and increase the decision-making process through it because it is extracted from Through cached data neural networks that provide business intelligence assistance in organizations [7].

B. Tasks

A large number of tasks suitable for the use of records in general will be collecting, evaluating, forecasting, estimating, and clustering, with outlining. An assortment of them will in general be best drawn nearer in the top-down design just although, in general, an incremental approximation is preferred, called discovery, which often leads to cancellation of regression [10].

With respect to Classification, is the highest well-known information mining undertaking and it comprises of analyzing the highlights of a recently introduced object to appoint for a pre-selected group of categories [18].

However order manages Partial results, with results of continuing value, appreciation is treated. In fact, evaluation is used regularly to perform a classification task [24].

Expectation manages the grouping of records as indicated by some anticipated future conduct or assessed future worth. Both are close gathering and mart crate examination with as a target to decide Things that can be put together. Grouping targets sectioning a heterogeneous populace into various many homogeneous groups and subgroups are also not previously identified.

The goal is to present data well, so the complex operations that take place in databases are described and explained [25].

C. Data Mining (Classification Techniques)

Here we find, a set of records in databases is assigned to a sample class or tag for classification from a large set of predefined class labels. For example, the organization will be eager to classifying each of them. All the options, as well as the yes or no option, belong to classification problems. The rating has at least more than one level, for example, "high," "medium," and "low." The central matter the number of classes is limited. It is noted who can be there a verifiable request we find the relationship inside the definition of each layer, for example, "high," "medium," and "low." [27].

Neural Network Proposed Techniques:

1) Multilayer Perceptrons Neural Network

Multi-Layer perceptron (MLP) is a stock forward neural A network consists of at least one layer of the input layer as well as the output layer, The first layer is the main layer and

is called the information layer, and the last layer is called the return layer and Between the first and the last layer there is only one layer.

Data flows forward relative to the feed forward in one direction from the first layer to the last layer. This type of network works by what is called a backscattering learning algorithm. MLP are commonly is used configuration request, affirmation, (MLP) can tackle issues which cannot be distinguished directly [28].

2) Neural Network (Probabilistic):

Class problems Here we can use (PNN). If an entry is submitted, the distances in the initial layer are calculated starting from the input vector and ending with the training vectors and producing a direction indicating the direction from the training input to the center [29].

In the second layer, the contributions of each class of inputs are combined so that its net output is directed to the possibilities. And then on most of those possibilities, the feature of switching outputs appears. You have a choice of the second layer options that produce either one for a specific category or zero for any other category.

Probabilistic Neural Network It is an architecture of neural networks that is useful and has a well-defined basis with little backpropagation, but it feeds the structure forward to be similar to the posterior diffusion. PNN is supervised learning set of rules but consists of and in the hidden layer, there are no weights [30].

3) Neural Network (Linear):

(LN) provides a benchmark by which we can examine the overall performance of a neural network. In other cases, a complex problem can be solved by means of a linear network, as happens in neural networks. It is used in the case of a small number of training cases, and here you do not need a model that is more complex.

In the case of a specific input with vectors, the result is an output directed to the target it corresponds to. Each vector has an input, and we hope for the time from calculating an output vector to the network. Each of them differs in error in relation to the output vector and the input vector. In the event that you want to find a value for each weight in the network to reduce all the error boxes to a minimum and to the lowest value. The problem is that linear networks have simple errors. For most cases, we can compute a linear network immediately, with the error being the lowest of the input vectors [30].

4) Neural Network (Radial Basis Function):

Neural Network (Radial Basis Function) it is based on a supervised learning algorithm which is pre-fed. Usually it consists through one hidden layer of a group of tools to choose to activate its own function through some of the features referred to called base features.

This network has many advantages, it works in a faster way and is less prone to input problems and the reason is the radiation behavior of each hidden unit.

The design of that network consists of three layers, but each part is separate from the other, which is a group of nodes in the case of input and in the case of output, so the reaction of the network to each type of input layers or the second layer is hidden and its dimensions are redundant.

It constitutes a class of different artificial neural networks, and its advantages over other different networks appear in terms of simple form and study in a faster manner. These types of networks depend heavily on an estimate of many of the parameters: weights, centers, and widths that link through the neural network [7].

IV. PROPOSED SOLUTION

A. A Framework of improving key performance indicators using Business Intelligence Techniques

The first figure shows the real A Framework for improving key performance indicators in the research paper. That the mining Techniques implemented the improving key performance indicators through the use of neural networks and Comparison the Classification results of Neural Networks, the Radial basis Function, Multi-Layer Perceptron, Linear and Probabilistic Neural Network to choosing the best result of neural network in data classification, for Application of best Key performance indicators (KPIs) by using Business intelligence Techniques to enhances to effectiveness to support and decision making.

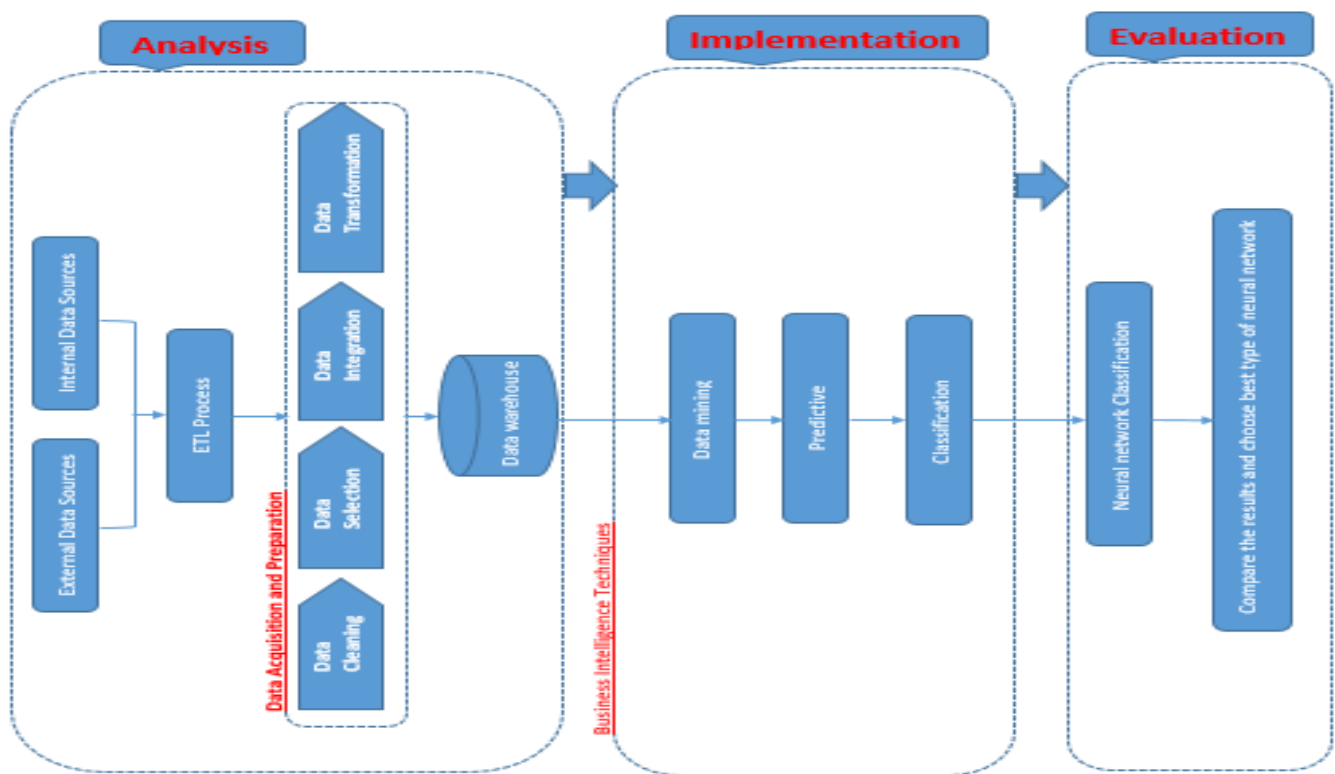


Fig. 1. A Framework for improving key performance indicators using Business Intelligence Techniques

B. A Framework stages:

1) *Data Sources" Collecting "*:

- Structured interview with expert (IT Department).
- The data acquisition documents using paper and flash memories.
- Note taking.
- conducted Interviews in person or over the telephone
- Interviews done formally (structured) or semi-structured

2) *The Data Extraction*

Through the research paper, the data used in measuring performance indicators were collected within one sectors, and the presence of duplicate data will lead to mistakes and low performance in the Neural Networks.

That way is followed to take neutral and clear and influential data in the process of measuring performance indicators to solve problems in the data warehouse.

3) *The Transformation Process*

Real data It includes all the data collected from the sector used for the measurement process of performance indicators, it is usually inconsistent, in addition to sometimes there is a lot of missing and unclear data, so an integration process is carried out for the data and the missing data is completed and the inconsistent data is excluded, and the process of changing those data will start to work ERP Schema.

i. *The Missing value:*

The missing data is deleted or replaced, and in the case of the replacement process, by setting a numerical rate based on the existing data, in a mean substitution, the average value of a variable is used in place of the missing data value for that same variable.

ii. *The Noisy data :*

The noisy data are data with a large amount of additional meaningless information in it called noise. It also includes any data that a user system cannot understand and interpret correctly, the error can be in the calculated values, and there are many methods that handle the wrong data such as clustering, it is able to handle the errors inside the data that resulted from different operations.

iii. *The Inconsistent data:*

The Inconsistent data is generally exacerbated by data redundancy. However, it differs from data redundancy in that it usually points to problems with the content of the database rather than its design and structure.

There are data inconsistencies in many transactions that need to be resolved, There is a lot of existing data that has been repaired and modified and prevent the presence of such contradictory data within the data warehouse.

iv. *Data Integration:*

Data collecting from many sources. Data integration helps to avoid inconsistencies and improve mining speed and quality.

This is done by saving all the data in the data warehouse and using more than one method to access that data in one place and a several database, Careful integration of data from multiple resources helps reduce and prevent redundancy and disparity in the data set that they cause. This can help boost accuracy, reliability, and rate from your next mining process.

v. *Data Selection:*

Selecting relations of data of given fascination for the research is the simplest manner to collect very last outcomes distinctly applicable to the lookup requirements.

This paper choose the right variables effect acquisition the best KPIs instances as suggestions for improvement, including deferent number of data transactions, Internal Data Sources and External Data Sources, choosing the factors that are supported as a result, This selection will improving key performance indicators.

vi. *Data Transformation:*

We find that the data transformed during the normalization method is very useful for classification algorithms as well as for neural networks.

Normalization greatly helps each computed property to develop the learning process, this method of normalization processes all data in appropriate forms to perform data mining.

V. TARGET DATA SET

The research paper applied 65% of records purposed for coaching the neural network and 35% will maybe be implemented as a completely impartial test on the network.

Also, that is because of the fact, if the neural network has been Implementation for a passing extravagant pair of information which were helpful for the training, it will not be particular it found to "prediction" or to "saving" pattern.

The neural network needs to increase the training process. Whenever new inputs are introduced into the neural network, it trains on it and learns through it. Therefore, it was necessary to perform two operations: the first process, which is the input process, and the next process is the training process for the network.

VI. CONCLUSIONS

The aim of the research paper is to present A New Framework for improving key performance indicators using Business Intelligence Technics As data mining, which greatly helps in extracting hidden relationships between data , and improving the new key performance indicators that will be followed by the institution and try to choose the best indicator among a group of indicators, and Ensuring successful access to institutions for their goals (improvement - correct deviations - making decisions) and measuring the success rates of the institution, and Identify the most important factors affecting decision-making by classifying them by degree of impact.

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