Analyzing Time series by using Data mining

Prof. Dr. Husam Abulrazzak Rasheed /<u>husamstat@uomustansiriyah.edu.iq</u> Fatma Hassan Al-Rubbiay/ fatima_h@uomustansiriyah.edu.iq

P: ISSN : 1813-6729 E : ISSN : 2707-1359 https://doi.org/10.31272/jae.i139.1099

Abstract:

Algorithms and complex data analysis techniques are used in multiple fields that are expanding daily, and with it the challenges in facing multiple and more complex data types, and the directions of exploration research vary according to the diversity of these fields, and their use is increasing in the modern era in the field of artificial intelligence, which aims to facilitate human life in various fields. Mining of complex data types includes mining of time series, symbolic chains, and biological chains, in addition to mining of graphs, computer networks, mobile data, text mining, and data streams.

In this study, the steps of data mining using time series are presented.



مجلة الادارة والاقتصاد مجلد 48 العدد 139 / أيلول / 2023 الصفحات: 279 - 281



Introduction:

The rapidly development of Information Technology (IT) has cause generated very large amount of databases and huge data in different fields. Therefore, Attention is directed to the accurate organization, manipulate, storage and mining of data for further decision making. Data mining is collecting, processing, cleaning, analyzing, and gaining useful data. There are a several of industries that are using it on a regular basis. Several of these organizations include retail stores, hospitals, insurance companies and banks.

Data mining technology is popular with various businesses because it allows them to know more about customer and make intelligent marketing decisions.

Data Mining Principle :

Data mining is a principle refer to process of extraction of important information and useful patterns from huge data. Data mining is also refer to discovery process of knowledge, extraction of knowledge and analysis of pattern.

logical processes in the data mining that is used to search through huge data in order to extract useful data. The aim of this technique is to find unknown previously patterns. These patterns can be used to make right decisions for development of businesses. Three steps involved are:

First step: Exploration is scanned and transformed into another form. Then determined nature of data according to the problem.

Second step: Pattern identification is explored, refined, defined and choose for the specific variables then identify and select the patterns to tack the best prediction.

Third step: Deployment Patterns are deployed to take the desired results.

Many of organizations are combining data mining with another things as statistics, pattern recognition, and other important tools. Data mining can be used to find patterns and connections that would otherwise be difficult to find.

Data Mining using Time Series:

Data mining using time series refers to the process of analyzing data collected over time to extract significant patterns and trends. Time series data is a series of points measured at successive time periods. This type of data is commonly found in various fields, such as finance, economics, medicine, meteorology, engineering, and others. Data mining using time series involves collecting and preparing time series data, selecting and analyzing data, modeling data using various techniques, evaluating model performance, selecting the best model, and using the given model to make predictions about new data.

Here are the general steps for data mining using time series:

- 1. Data collection: Collecting time series data, which can be a sensor, database, or any other type of data warehouse.
- 2. Data preparation: data classification and pre-processing. This may include removing missing values, addressing data heterogeneity, or modifying data.
- 3. Identification of time series: It is often useful to identify time series data to gain insight into underlying patterns and trends. This can be done using different types of charts, such as scatter charts, and box charts.
- 4. Time Series Analysis: Time series data can be analyzed into its various components, such as trend, seasonality, and noise, using different methods, such as moving averages, exponential smoothing, and others.
- 5. Time Series Modeling: Time series modeling involves fitting a mathematical model to the data to describe underlying patterns and trends. This can be done using different

types of models, such as ARIMA (Auto Regressive Integrated Moving Average) models, exponential smoothing models and others.

- 6. Model Evaluation: Evaluate the performance of the time series model using various metrics, such as Mean Squared Error (MSE), Mean Absolute Error (MAE), Mean Squared Error (RMSE), etc.
- 7. Model Selection: Once the performance of the models has been evaluated, the best model can be chosen based on the evaluation metrics.

Conclusion:

- 1. The important matter for mining of data the patterns, collecting, extracting of knowledge etc., in the most areas of business domains.
- 2. In the modern businesses, knowledge and knowledge management has become a key of economic intelligence business .
- 3. Algorithms of Data mining such as classification, segmenting , clustering, etc., apply to find the most perfect patterns to decide in businesses .

References:

- 1. Marina M., Milan S. "Data Mining in Time Series", University of Kragujevac, Serbia, 2011.
- 2. Bharati M. R., "Data Mining Techniques and Applications ", Maharashtra, India, 2011.
- 3. Ebeid, Mostafa Fouad, "Advanced Analysis and Data Mining", first edition, Dar Al-Fikr Al-Arabi, Egypt, Cairo, 2017.