

PREMISES OF USING THE TECHNIQUES IN DATA MINING AUTOMATION OF INDUSTRIAL PROCESSES

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Abstract: Data mining techniques can be found in a variety of application areas in this article was presented three examples (two oil field, one of the economy), their use in decision support coming for improved decision-making.

The investigations presented in this section have contributed to addressing systemic petroleum activity (activity of extraction) and automated system development for assisting and developing decision finding methods to optimize the economic and technical data for the extraction of oil in a large quantity (oil / gas).

Keywords: data mining, processes, decision support, petroleum activity, methods.

1. USING DATA MINING TECHNIQUES IN THE AUTOMATION OF THE INDUSTRIAL PROCESS

A challenge in automation can be considered and data mining techniques involved in the management of different types of processes. Thus, it aims to increase performance at different levels of management decision within a scaffold oil.

Industrial processes provide a variety of operational data, their characteristics are summarized as follows: high-volume, high dimension data, uncertainty of the process and the existing noise implies preprocessing techniques of data, dynamic of data, etc.

The underlying premise is the base of possible uses of data mining techniques in the field of automation.

This can identify situations where data mining techniques can be applied:

- The definition - here you can successfully apply data mining techniques to identify objectives to be achieved. Since the defect is considered as any deviation from the norm that causes damage, you will need to collect and analyze data related to this problem so it can settle clear quality limits.

Also here there can be applied data mining techniques to identify possible causes of defects and to identify potential opportunities for improvement.

- The measurement – there is obtained a set of data related to economic or production process to be optimized.

These data must be interpreted to better understand the situation correctly to determine the distance between it and the goals that must be met.

In general this is used in exploratory and descriptive analysis of data, but if there are very large data volumes or complex nature data in this situation may require data mining techniques.

- The analysis - is done usually by statistics. But in some cases can be used more advanced techniques of data analysis (data mining) when they are needed.

Data mining techniques have advantages when we deal with large and very large volumes of data. Using data mining techniques we can obtain important information on the review. You can even identify specific patterns and sequences in the conduct of business or production processes.

These models can then be exploited to see where defects occur which are usually the main causes them to be removed. Thus, it was found that in general the vast majority of failures occur because of a few factors.

Once identified and eliminated, these factors obtain a high level of performance improvement.

- The improvement - and there could be data mining techniques used to identify solutions to optimize processes analyzed, and to validate certain models in case that has sufficient data will allow a deeper analysis. In some cases it is possible that by improving a process not to have a lot of data relative to the new operating that permit data mining techniques.

- The control - in this part in addition to ensuring that economic and production process optimization is implemented properly, can be done after testing it to check at the end if everything is as desired.

And here is an analysis of data from the optimization process operation can be done with data mining techniques that gather volumes of data.

1.1. Examples of application of data mining techniques to automate extraction processes

Following the survey, we identified some of the applications of data mining techniques in the automation process, namely: identification of defects associated with manufacturing technology, predicting values of process parameters, etc. In this article are given two case studies that reflect the benefits of applying data mining techniques in industry (oil). The first case deals with data mining techniques to optimize the activity of oil in a scaffold, and the second case highlights the diagnostic problems of economic and technical data using data mining techniques in the oil system of scaffolding.

The first case shows how data mining is to take data from all processes of an economic entity, and then apply advanced techniques to extract useful knowledge analizăși which can be very important for optimization of the company. Usually analyzed data volumes are very high and there should be strong systems only became more accessible in recent years.

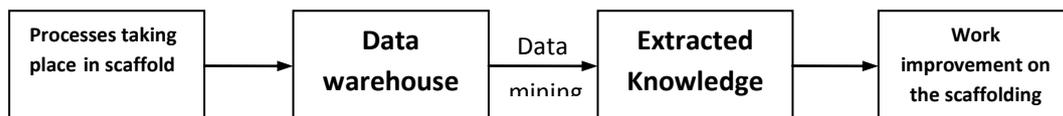


Fig.1. The goal is to optimize data mining activity in the scaffolding

In the figure above, is shown how data mining helps to optimize processes oil from a scaffold that has some data to analyze. This model of knowledge of data extraction can be found in principle in any field. Data is collected and stored in

databases or data warehouses for a long time and usually can be analyzed later.

Data mining module takes the data from all processes that occur in scaffolding, applying advanced

techniques to analyze and extract useful knowledge can be very important for optimization of oil.

Usually analyzed data volumes are very high and there should be strong systems only became more accessible in recent years. The second case is a system to integrate data mining into the computer system of scaffolding.

It is necessary therefore to have a computer system in advance or at least their data to be exploited before it can use a data mining system.

In most of the cases of a scaffolding computer system consists of a collection of applications that are interconnected and have access to data, often stored in relational databases, or more efficient in data warehouses (data warehouse).

System users have access to the data using these applications (Fig.2.).

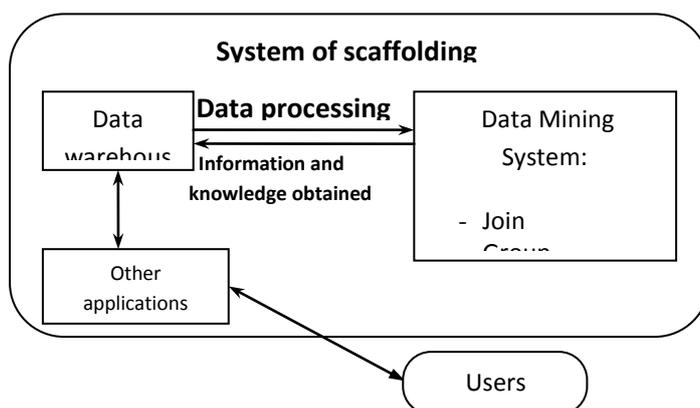


Fig.2. Integrating data mining system in the computer system of scaffolding

For integration of data mining system in the computer system of demurrage, it must be able to take data from the computer system using advanced techniques to analyze them, such as clustering, association, prediction, regression, etc. Following analysis of existing data can be extracted useful information and knowledge at different levels within the firm, the basic activity by top management. Another thing to consider before deciding to integrate a data mining in information system of the scaffold is the importance of data that the scaffold has. Oilfield data that it holds or to which access must be relevant and contain potential knowledge to be sought using data mining techniques. This could make an assessment of data to which access scaffolding.

In most of the time use data mining techniques for business benefit, regardless of their field of activity. Last but not least be taken into account the costs of implementing a data mining. For small companies it may be important which can slow down the penetration of this market data mining products. On the other hand, large firms use these products and has already shown benefits.

Information systems are of very wide applicability. They can be found in almost every field of human activity that can be computerized. Where such systems exist and where to collect large amounts of data, whether in databases or data warehouses.

Data mining systems, using specialized techniques, provide useful information and knowledge domain are applied advanced analysis of existing data. Another important application is to use data mining techniques for strategic management of firms.

For a company is of primary importance that the decisions taken at the top to be taken on an informed basis and not based solely on talent and experience manager.

It became possible with the possibility of making predictions based on data that the company has access. This is perhaps the area where data mining techniques are essential when the data will be analyzed reached a quantity cannot be traditionally managed.

2. CONCLUSIONS

In conclusion we can say that data mining techniques are very different application domains, which are used where there are large volumes of data to be exploited. They can be integrated into systems used in the economic environment.

Data mining techniques in economics can bring many advantages to companies that use them in their work area and management level. Therefore we can expect the market for data mining products to grow significantly in coming years. The investigations presented in this section have contributed to addressing systemic petroleum activity (activity of extraction) and the development of automatic system for elaboration assist decision finding methods to optimize the economic and technical data in order to extract a larger amount of oil (oil / gas).

Data mining techniques can be found in a variety of application areas, in this article was presented three examples (two oil field, one of the economy), their use in decision support coming for improved decision-making.

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