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ANALYSIS OF DEPOSIT PREDICTION ALGORITHMS

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ABSTRACT

The article analyzes the existing and proposed methods for the development of oil fields. The model of V.D. Lysenko and its efficiency of use, advantages and disadvantages, the results of practical application are given. From the program, you can get not only a numerical result, but also a result in the form of a diagram or a list. Each result obtained was only comparative and its various external factors were not taken into account.

KEYWORDS: *Filtration, Oil and Gas Fields, Reservoir, Lysenko Model, Flow Rate.*

INTRODUCTION

Today, there is practically no industry in which information technology has not penetrated. This allows the use of information technology in any area. The use of information technology in various industries has led to the development of the industry and high economic efficiency.

There are also several types of methods and algorithms for forecasting oil fields. They were studied by the following scientists.

ANALYSIS OF LITERATURE AND METHODS

A simple approximate method for calculating the filtration movement in an oil field was developed by B.B. Lapuk [1]. Shows the sequence of the amount of water entering the oil field and the actual amount of water entering the oil field.

S.N. Zakirov considered the calculation of the coefficient that determines the amount of oil produced. New production methods and algorithms for determining oil properties have been developed [2].

Academician L.S. Leibenzon was the first to investigate the problem of fluid motion in a layer according to the laws of hydromechanics.

To facilitate the solution of the problem, L.S. Leibenzon suggested that the ultimate pressure, which actually changed during the development of the gas field, was constant and equal to the initial pressure [3].

I.A. Charn first studied the application of sequential changes in the steady state, which allows to evaluate the elastic properties of the aquifer, and the pressure in the water supplied to the oil field [4].

And research by Yu.P. Korotaeva, G. Stepanova and S.L. Kritskoy [5] show that the object of information for optimal classification is hydrocarbon deposits. They are calculated according to the following indicators:

$$x_1 = 10p_{пл} / C_5H_{12} + \text{higher. ;}$$

$$x_2 = (CH_4 \ldots C_4H_{10}) / (C_5H_{12} + \text{higher}) + C_2H_6 / C_3H_8$$

$$x_3 = (CH_4 + C_2H_6) / (C_4H_{10} + \text{higher})$$

According to the research of V.V. Savchenko [6] , the usefulness of oil wells can be judged by the following features:

1) Containing more than 1.75% or more of stable C5H12 + condensate emissions and more than 80 cm^3 / m^3;

2) the presence of petroleum hydrocarbons in stable condensate;

3) Outflow of stable condensate to the gas condensate wall .

In the work on non-isothermal filtration in the development of oil fields, the effect on productivity and oil production rates in large volumes of water at low temperatures is described, as well as their dependence on thermal methods of stimulating the formation. Mechanisms for replacing oil from seams during heat generation are considered. Examples of determination of filtration indicators and indicators of technical and technological development when replacing oil with water are given.

K.M. Don u s [7] considered the theory of the development of oil fields. It provides an overview of the production process, geological study of deposits based on the hydrodynamics of porous, fractured and fractured porous layers, as well as the development and economics of oil fields. The necessary guidelines for the development of oil fields for different reservoir methods

are considered. Methods of control and regulation of the process of oil field development are described.

Yu.P. Zheltov and I.S.Gutman considered and the basic ideas of the development of oil fields, methods for constructing models of oil reservoirs and the processes occurring in them, [8] , [9] . Methods for calculating the development of oil fields in natural modes and artificial impact on them by pouring water, various substances, as well as creating intraplastic processes associated with a change in the physical and chemical state and the achieved temperature regime of the developed objects are described .

RESULTS

The process proposed by V.D. Lysenko, based on the law of decreasing flow in the mathematical model of technological parameters and dynamics data during the development of oil fields, is characterized by the following function:

$$q = q_0 e^{-\frac{q_a}{Q_0} t}$$

The function works as follows:

- Start
- Input of primary data of an oil field
- Selection of points used in the calculation
- Find the initial supply for mining
- Calculate the reserve for production
- Calculate the remaining oil reserve after production
- Calculate the dynamics of the development process for each well for the next period
- When the set debit value is reached, $q_{P\text{-}r} = 1t / d$ is calculated .
- The result is determined and the analysis is carried out
- the end

Algorithm for forecasting the flow rate according to the model of V.D. Lysenko is the following: and. preparation of incoming data for mining ; b. Identify hotspots under specific conditions:

• The average value of the change of points is determined;

• Points that are far from the specified values are considered inactive, and their relatives are considered active;

• The entire distance is divided into small sections, on which the average values of these sections are located;

• Points that are far from the found values are not activated, and their relatives are considered active;

• Sudden changes, that is, a sudden increase or decrease in the debit value, are divided into active and inactive by comparing the following points.

C. build a graph by active points;

D. complete the calculation when the set debit value is reached (q_{p-r} = 1t / d).

DISCUSSION

The algorithm was used to predict the production on an oil well " Umid " .

Design parameters of oilfield wells " Umid " and predicted flow rates for the next period are given in the table below.

TABLE 1. PRODUCTION INDICATORS FOR THE NEXT PERIOD FOR WELL 72 " UMID "

Deposit name :	*Umid*
Skavazhina number	72
Initial production stock , t	49141.76
Total working day of the well	4,735.04
The rest of the working days of the well	5.76
Oil stock after production , t	6,538.81

One of the most important parameters determined by the method of V.D. Lysenko, is to predict the amount of the debit. The advantage of this model over other models is that it takes data, processes it, and predicts how long the oil reserves will last.

Based on this technique, a program has been developed that predicts the amount of debit (Fig. 1).

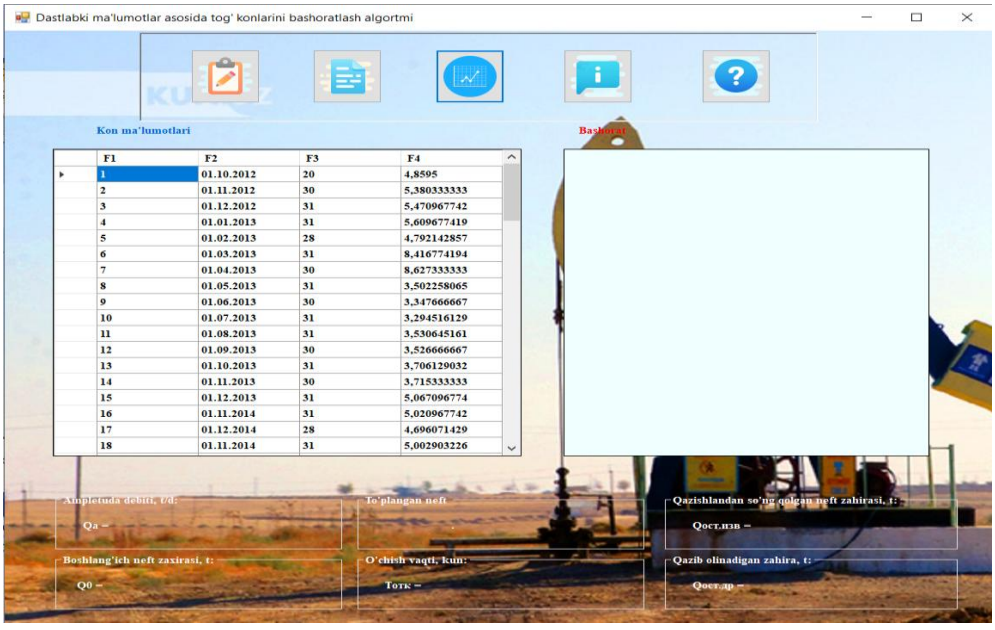

Fig. 1. The program interface prediction I debit amount

The program loads already existing data. To update the data, you need to open Excel and change the data, then restart the program. The program takes data and prepares it for processing (Fig. 2).

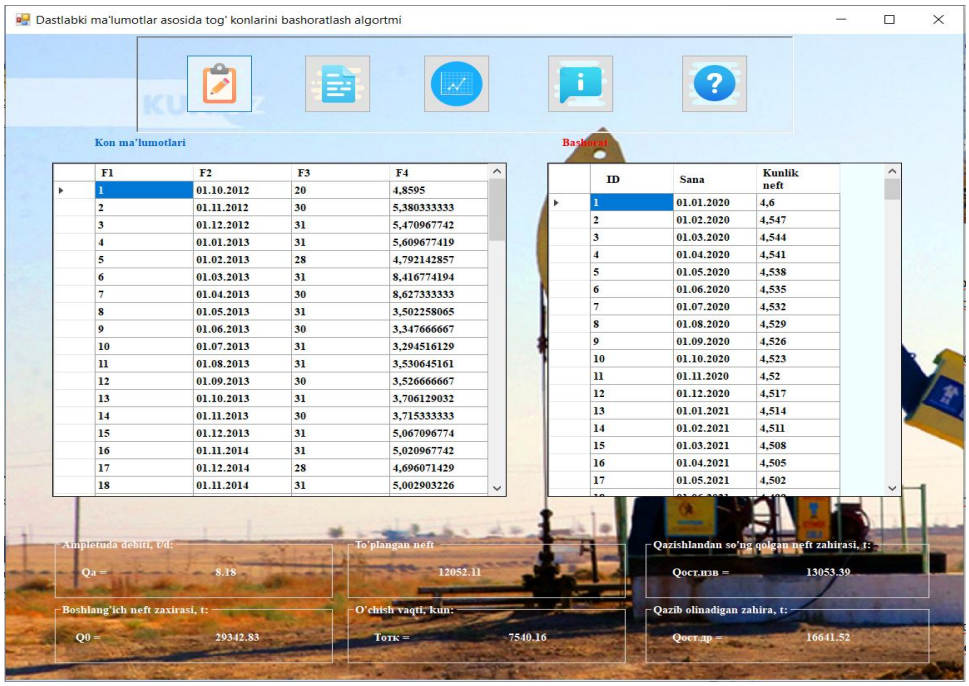

Fig. 2. Data processing

After the completion of the calculation, the data will begin to be displayed in an empty window next to the window, in which the information of the field of data analysis is loaded. The program calculates each step and then returns the result (Figure 3).

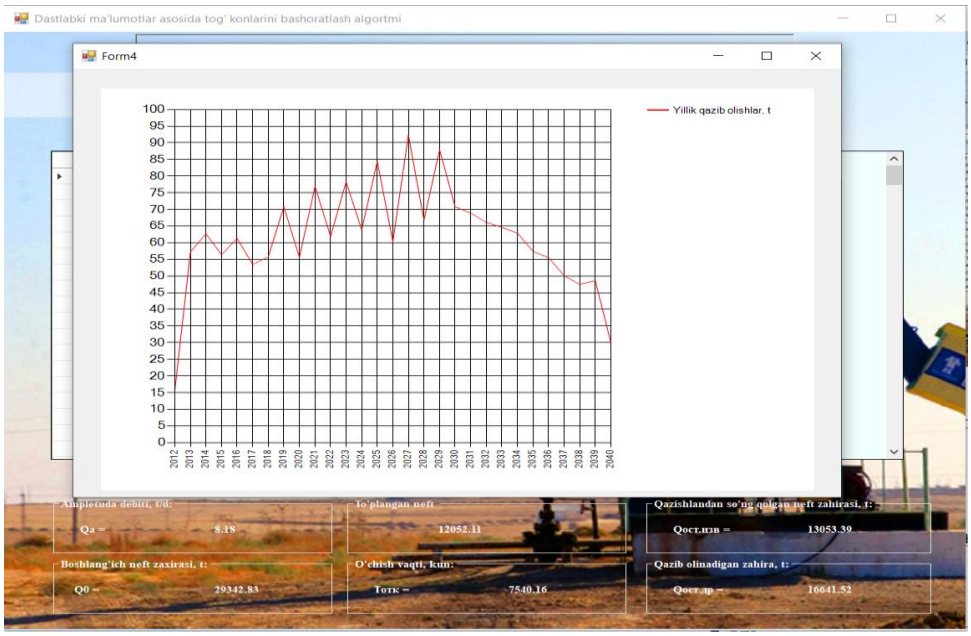

Fig. 3. The result of the program

From the program, you can get not only a numerical result, but also a result in the form of a diagram or a list. Each result obtained was only comparative and its various external factors were not taken into account. Its effectiveness is comparable to that of other programs. The program works only according to V.D. Lysenko gives the result in exactly this way.

To make it easier to solve the problem, L.S. Leibenzon developed a solution to the problem by assuming that the ultimate pressure, which changes during the development of a gas field, is constant and equal to the initial pressure.

In the methodology of V.D. Lysenko, active points are taken and this is done according to special formulas. Yu.P. Zheltov developed a model for predicting the oil field cycle, taking into account the situation that was not taken into account in Lysenko's model. In the model of V.D. Lysenko carried out only settlement practice. Exceptions were not considered, ie. E . with uschestvuyut externalities for oil. For example, bad weather influence can affect the operating mode, or a strong earthquake may cause varying degrees of damage to the oil field by varying ix flow and oil influence on oil wells .

Of course, the V.D. Lysenko works with approximate numbers and determines the approximate life of the field.

CONCLUSION

According to the method of V.D. Lysenko processed data 72- well field " Umid " and a forecast of stocks of these wells and production indicators for the next period. It predicts production rates to be produced in the coming years by processing the initial monthly data for the specified wells. For forecasting, hot spots are first separated from well observation points and used in the calculation process. The software has been tested by comparing the results obtained with the exact results.

In practice, this model was used in the hole 72 - oil and gas field " Umid " in Kasbinskom area Kashkadaria region to the present time using this model, calculations were performed on a number of wells.

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