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Decision Support System for Forecasting Palm Fruit Production With Trend Moment Methode Case Study of Kasus PT. Plantation Archipelago III (Persero) North Aek Nabara

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Abstract

This study aims to determine the application of the Itrend moment method in determining forecasting of palm fruit production. Oil palm plantations are one of the industrial strategies in Indonesia. Oil palm trees are plants that provide many important roles for humans, such as raw materials that can be used as fuel and produce food oil. Therefore, it is not surprising why there are so many oil palm plantations scattered throughout the archipelago. One of them at Pt. Perkebunan Nusantara III (Persero) Kebun Aek Nabara Utara where the company is engaged in oil palm and rubber plantations. This research is supported by using the trend moment method to facilitate forecasting of palm fruit production. By doing forecasting, it will be easier to find out the amount of palm fruit production just by forecasting some symptoms, such as weather, climate, and temperature. In addition, this method is assisted by using a system, namely a decision support system. Where able to take or determine decisions from a forecasting (forecasting).

Keyword: Decision Support System, Trend Moment Forecasting, Oil Palm Plantation.

1. Introduction

Oil palm is a plant that has a role as a raw material for producing food oil, industrial oil, and biofuels (biodiesel). [1] Oil palm (Elaeis guineesis Jacq) originates from the African continent, from the 14th to 17th centuries, Palm fruit was brought from Africa to America, and its spread reached eastern America, to be precise in Brasilia. Palm oil is a plantation commodity that is quite important in Indonesia, and has high economic value in terms of industry where its development is very extensive. [2] Oil palm plantations are currently growing in Indonesia and almost the entire archipelago is grown by oil palm plants. Sumatra Island is one of the largest oil palm plantations in Indonesia with an area of 7,944,520 hectares in 2019. As a producing plant, oil palm plantations are very beneficial for the people's economy because they produce palm oil and palm kernel which are one of the prima donna of plantation crops as a source of non-oil and gas foreign exchange for Indonesia, therefore Indonesia is called one of the largest palm oil producing countries in the world. .One of the companies engaged in managing oil palm, namely PT. Perkebunan Nusantara III

(Persero) North Aek Nabara Plantation which aims to produce good, healthy oil palm productivity and of course maintain its quality and have full potential in managing oil palm plants.

The product produced from oil palm fruit is vegetable oil which is obtained from fresh fruit bunches (FFB) and coconut oil. FFB and loose fruit are processed into processed semi-finished products in the form of crude palm oil and palm kernel oil, which can be processed into further processed products with various uses, especially as the main raw material for making edible oil. As time goes on with efforts to increase production capacity, it seems that plantation companies are also making efforts to increase the efficiency of oil palm production so that the prices of these palm fruit products can be more competitive than before. This research is supported by using the trend moment method to facilitate forecasting of palm fruit production.

Forecasting method is one of the methods used to control production. This method is quite commonly used by large companies. However, some small and medium oil palm smallholders are still unable to understand how to determine the amount of palm fruit to be produced. This method plays an important role in a company or industry.

The Trend Moment method is one of the methods used in forecasting production, which will later be used as the basis for forecasting a production in the following year.

Decision Support Systems (DSS) are part of a computer-based information system which is also knowledge-based that is used to support decision making within an organization or company. DSS can also be said as a computer system that works as a data processor and becomes a source of information in making decisions on specific semi-structured problems.

2. Research Method

According to Moore and Chang, a Decision Support System can be described as a system that has the ability to support ad hoc data analysis and make decision-oriented modeling for planning in the future. This Decision Support System aims to provide information, provide predictions, guide, and direct solution options to users of information so they can make better decisions.

[6] Forecasting is predicting an event using past data needed to estimate future data. Forecasting or forecasting is the most important part for every company or business organization in every decision making on the amount of palm fruit to be produced.

The Trend Moment method is one of the methods used in forecasting production, which will later be used as the basis for forecasting a production in the following year. This method can be used to forecast the amount of palm fruit production by using certain methods of statistical and mathematical calculations to determine the function of a straight line as a substitute for broken lines formed with historical data on the amount of production which will later produce a production forecast. next period.

In applying the Trend Moment method, it can be done using historical data from variables, while the formula used in the preparation of this method is:

$$Y = a+bX$$

Where :

Y = trend or variable value to be forecasted

a = constant number
b = slope or trend line coefficient
X = time index (starting from 0,1,2,....n)

To find the value of a and b in the formula above, it is used in a mathematical way with the solution using the substitution method and the elimination method.
The similarities are:

$$\Sigma y = a.n + b.\Sigma x$$
$$\Sigma xy = a.\Sigma x + b\Sigma x2$$

Where :
Σy = amount of sales data
Σx = sum of time periods

3. Result And Discussion

In this system requirement, the author will explain some of the system requirements in designing a required system, namely the system requirements for computer equipment consisting of an Intel Core i3 desktop computer, 500GB hard disk storage media and 4GB memory. As for the software requirements, it consists of the Microsoft Windows 10 operating system, XAMPP (Apache, MySQL)

After discussing several program design views in the discussion of the previous chapter, there are several input and output displays that the author will display in accordance with the design that the author has designed. In the following, the author will display an interface for the main page of the decision support
system application when it is run.

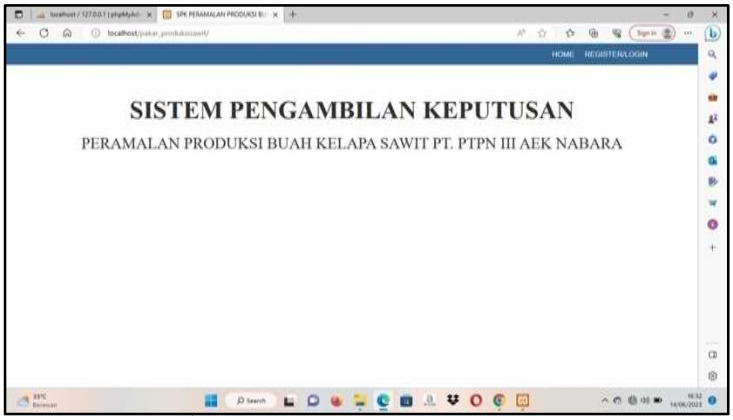

Figure 1. Main Display

The Login display is a registration display for new users, by filling in the username and password along with the requested personal data. Meanwhile, login is for users who have already registered.

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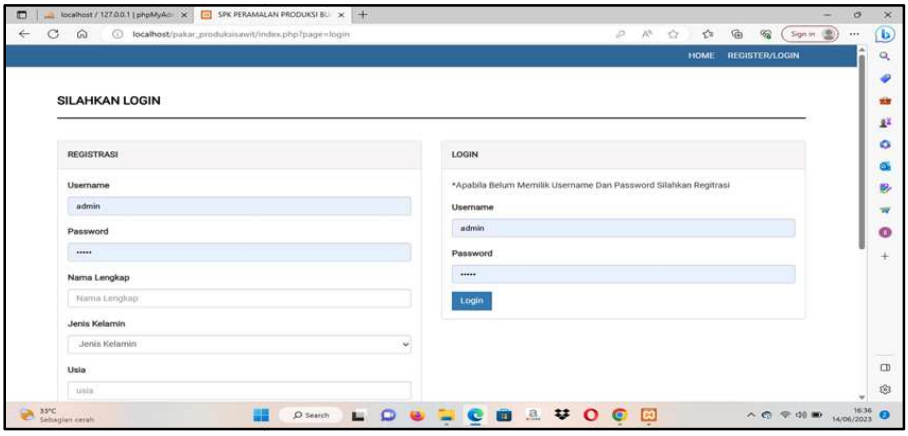

Figure 2. Login Display

Home view, the user can find out the definition of an expert system and how the decision support system works.

Figure 3. Home Display

Display Forecasting Data, displays the initial process of data entry in the form of serial numbers, forecasting codes, and forecasting names.

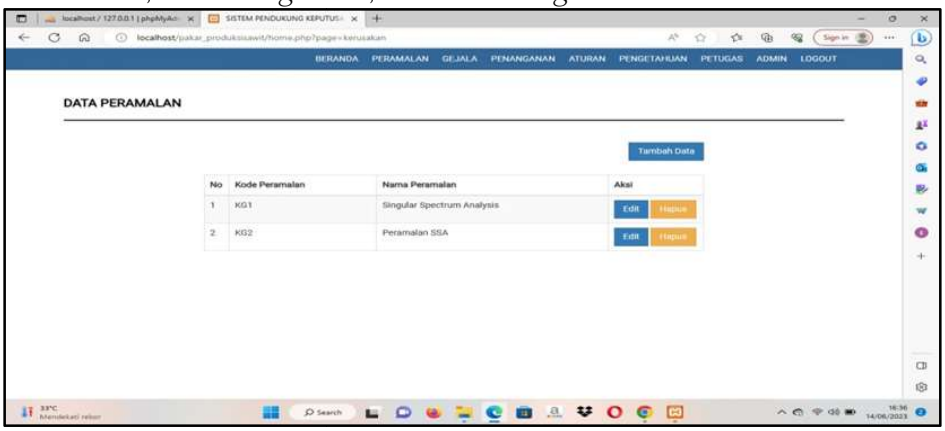

Figure 4. Forecasting Display

Symptom data display, users can view and operate the symptom data menu which can affect the productivity of palm fruit production.

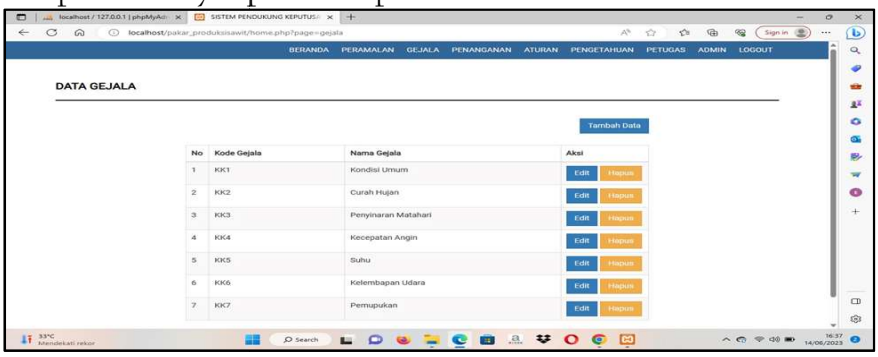

Figure 5. Symptom Display

Officer Data Display, the user will see a list of officers who have input data related to the condition of palm fruit productivity to generate forecasts.

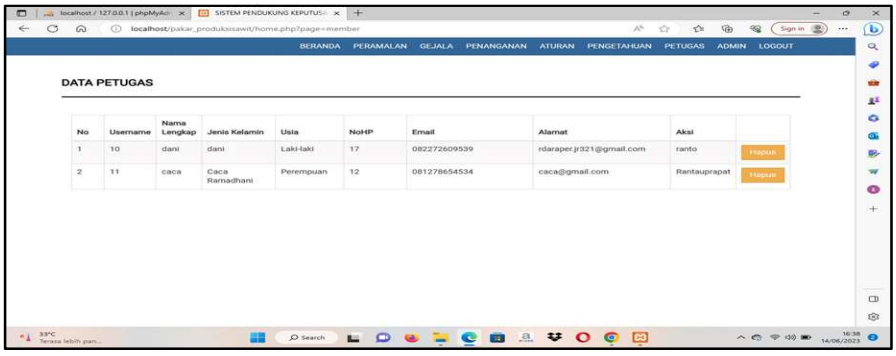

Figure 6. Officer Data Display

Data Display Results Reports, forecasting consulting results will appear after the user has inputted data.

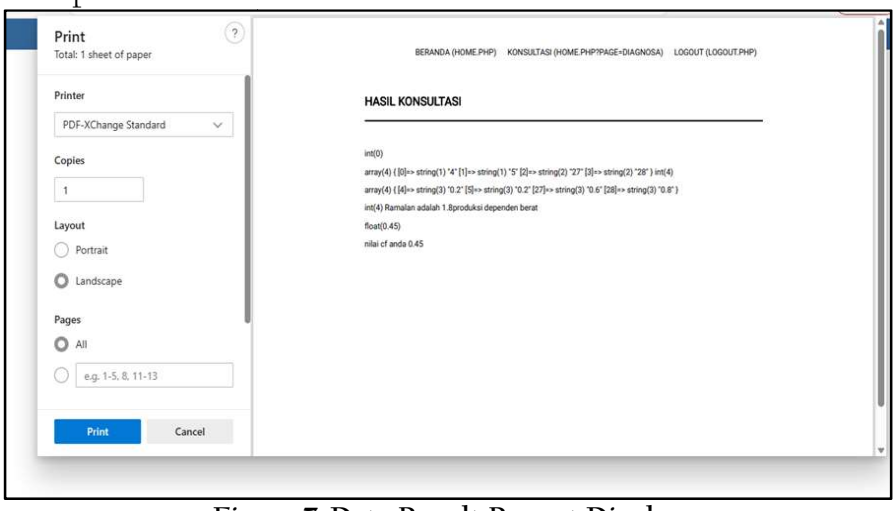

Figure 7. Data Result Report Display

4. Conclusion

In discussing this conclusion, the author will explain based on the authorship of this journal, namely designing a system that will be used for forecasting palm fruit production at PT. Kebun Nusantara III (Persero) Aek Nabara Utara, in designing a decision support system that will present forecasting results in a flexible and responsive manner.and in storing and processing authorship data using superior programming languages, namely PHP and SQL, where the overall results will be stored in a database (mysql). I hope that with this palm fruit production preservation application it can help PT. Nusantara Plantation III (Persero) Aek Nabara Utara.

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