# UNIVERSITI TEKNOLOGI MARA

# TECHNICAL REPORT

## FORECASTING THE CHANGES OF CRUDE OIL PRICE BY USING FUZZY INFERENCE SYSTEM

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**Report submitted in partial fulfillment of the requirement**
**for the degree of**
**Bachelor of Science Mathematics**
**Faculty of Computer and Mathematical Sciences**

**DECEMBER 2018**

## ACKNOWLEDGEMENT

IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

Firstly, we are grateful to Allah S.W.T for giving us the strength to complete this project successfully.

Next, we would like to express our deepest gratitude to our supervisor, Sir Muhamad Luqman bin Sapini for monitoring us for a year from the start of the final year project proposal to the completion of our final year project. He has given us a lot of valuable knowledge and experience for us to benefit of in the future. He always gives a word of encouragement and guidance without fail so that we could complete this project.

We would also like to thank Madam Norliza Muhamad Yusof for helping us complete this project. She also shared some knowledge with us about the proper way to complete this project professionally. Not forgetting our appreciation to Dr. Mat Salim Selamat, the subject lecturer of MSP 660. He has provided guidance and knowledge on how to write reports well to gain high marks.

In addition, we would like to express our deepest thought and thanks to our parents who are always giving us an encouragement and spirit for us to keep striving for the best in our life. Lastly, we also would like to acknowledge our friends for giving us so many information and had help us in anything that we do not know.

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## ABSTRACT

Forecasting the changes of crude oil price is always being the crucial issue in the trade merchandise's economy. Traders always face difficulties in selecting an appropriate trading strategies because of the price fluctuations. Besides, there are still no accurate method in forecasting the changes of the crude oil price. Hence, a method is needed to predict the changes of the crude oil price. Fuzzy Inference System (FIS) is chosen in this study to forecast the short-term and long-term of changes of crude oil price where the Fuzzy-Rule based consists of collection of fuzzy IF-THEN rules. This system uses two different number of IF-THEN rules in mapping input to output to generate the outcome and to find the accuracy of the forecasting performances by comparing the Root Mean Square Error (RMSE) of FIS with RMSE of Autoregressive Integrated Moving Average (ARIMA) and Single Exponential Smoothing (SES) models. As a result, short-term forecasting by using 12 IF-THEN rules has the higher accuracy compared forecasting by using 20 IF-THEN rules and the other forecasting models but in long-term forecasting, SES outperformed the FIS. The error obtained can be accepted in the field of forecasting the changes of crude oil price because it is presumed to be low.