

RANKING MOTORCYCLE BRAND USING FUZZY TOPSIS

Muhammad Nur Ikmal Nooralam and Zurina Kasim
College of Computing, Informatics and Mathematics,
Universiti Teknologi MARA, Perlis Branch
ikmal101.saina@gmail.com and zkas@uitm.edu.my

ABSTRACT - Motorcycle have become a crucial mode of transportation, with various manufacturers offering a wide range of options. In this study, the most preferred motorcycle brand was chosen using the Fuzzy TOPSIS method. The aim is to determine the most preferable motorcycle brand in Pokok Sena, Kedah and to compare the result with previous study. In this study, three decision-makers determined the motorcycle brand according to these following criteria by Ngantung. (2013); price, safety, efficiency, design, performance, and durability. The data were collected through the distribution of a questionnaire to experts in the area of study. The obtained data were calculated using a formula and Microsoft Excel. The results show that Yamaha is ranked first among the three brands, closely followed by Honda, and Modenas. The CC values obtained for Yamaha, Honda, and Modenas are 0.2869, 0.2852, and 0.1447 respectively. The marginal difference of 0.017 in CC values between Yamaha and Honda suggests a highly competitive scenario between the two brands. By providing a comprehensive assessment of motorcycle brands, this research contributes to enhancing the understanding of buyer choices and supports the development of an effective decision-making framework in the context of motorcycle purchases.

Keywords: Fuzzy TOPSIS, ranking motorcycle brands.

1. INTRODUCTION

Motorcycle is one of the importance needs of modern life in term of transportation. However, selecting the best motorcycle is not easy. In this research, the best motorcycle brand using the Fuzzy TOPSIS method. The decision-making process when purchasing a motorcycle can be challenging due to various criteria, such as price, safety, efficiency, design, performance, and durability. The study aims to rank the motorcycle brands Yamaha, Honda, and Modenas based on these criteria. Data will be collected through questionnaires distributed to motorcycle sellers in Pokok Sena, Kedah, which has a high population and demand for motorcycles. The findings of this study will provide valuable information to potential buyers in Pokok Sena and assist motorcycle sellers in identifying brands with high potential and demand. Additionally, other researchers can use this study as a reference for employing the Fuzzy TOPSIS method to rank alternative options.

2. METHODOLOGY

Data will be collected through questionnaires distributed to experts in Pokok Sena to rank motorcycle brands using the Fuzzy TOPSIS method. The experts will evaluate the brands based on criteria such as price, safety, efficiency, design, performance, and durability. The collected data will be analyzed using the steps of the Fuzzy TOPSIS method, which involve aggregating fuzzy ratings, calculating the fuzzy decision matrix, normalizing the decision matrix, determining the weighted normalized fuzzy decision matrix, finding the FPIS and FNIS, calculating the distances from FNIS and FPIS for each alternative, determining the closeness coefficient, and ranking the alternatives. The results will be compared with a previous study.

3. RESULTS AND DISCUSSION

Based on the results, Yamaha being ranked first with a CC value of 0.2869, followed closely by Honda with a CC value of 0.2852, and Modenas ranked third with a CC value of 0.1447. This outcome aligns with the findings of a previous study by Walone, (2016), confirming that the Fuzzy TOPSIS method effectively determines alternatives based on the given criteria. It is worth noting that the difference in CC values between Yamaha and Honda is only 0.017, indicating a close competition between the two brands.

4. NOVELTY OF RESEARCH/PRODUCT

There some research about Fuzzy TOPSIS. The research by Kore et al. (2017) stated that Fuzzy TOPSIS can be use to rank the alternative given by its criteria. This research uses Fuzzy TOPSIS to rank 3 motorcycle brands which are Yamaha, Honda, and Modenas. The criteria are price, safety, efficiency, design, performance, and durability. There also step in conducting Fuzzy TOPSIS to rank the alternative.

5. CONCLUSION

In conclusion, the study demonstrates the usefulness of the Fuzzy TOPSIS method in assisting buyers in making informed decisions when choosing a motorcycle brand, and it highlights the importance of considering multiple criteria to find the best fit for individual preferences and needs. The result shows that Yamaha was ranked number 1 for both method of Fuzzy TOPSIS and Fuzzy AHP.

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