Research Exhibition in Mathematics and Computer Sciences (REMACS 6.0)/
ISBN: 978-629-97440-5-4

SELECTION MOTORCYCLE BRANDS IN KOTA BHARU USING FUZZY ANALYTIC HIERARCHY PROCESS

Nur Atirah Annuar Farish and Suzanawati Abu Hasan
College of Computing, Informatics and Mathematics,
Universiti Teknologi MARA, Perlis Branch
annuarfarishatirah@gmail.com and suzan540@uitm.edu.my

ABSTRACT - In Kota Bharu, motorcycles have gained popularity as a means of transportation since they provide residents with convenient and economical mobility. This study attempts to help purchasers rank motorcycle companies and establish their criteria for buying using the fuzzy AHP. Primary data was gathered using questionnaire surveys and customer knowledge interviews. The study concentrated on Yamaha, Honda, Suzuki, and Modenas as the leading motorcycle brands. Surveys were created using criteria taken from current research, including financials, features, and promotions. According to the study, Honda motorcycles were favoured over Suzuki, Yamaha, and Modena models. Based on four factors—financials, features, promotion, and motorbike type—the FAHP technique was used to assess the performance of several motorcycle brand names. Priority was given to financial factors, features, motorbike type, and promotion was given the least importance. Based on their needs, lifestyle, and financial limitations, purchasers in Kota Bharu can use the study's systematic methodology to make informed motorbike purchases. The research advances our knowledge of consumer preferences and can help motorcycle dealers create robust brand positioning strategies. The FAHP methodology can also be used to enhance decision-making and product or service ranking.

Keywords: Fuzzy analytical hierarchy process, motorcycles, purchasing decisions, customer behaviours

1. INTRODUCTION

Scooters, motorbikes, and mopeds are popular types of transportation on two-wheels worldwide. Despite the country's hot temperature and frequent rain, motorbikes are still popular modes of transportation in Malaysia. A motorcycle with an engine capacity of 125 cubic centimetres or less uses less fuel and is more economical for extended travel. Motorcycles also create fewer carbon emissions and require less frequent repairs and maintenance than automobiles (Holyoak & Bray, 2015). Motorcycles are a realistic answer in congested cities with limited parking and excessive traffic. They may be easily parked in approved areas, and their flexibility lets riders handle traffic better (Hussain et al., 2005). In many developing cities, alternative forms of transportation cannot compete with the level of accessibility that is provided by motorcycles. Their wages are sufficient to cover the ever-increasing cost of living, enabling them to save and invest their money carefully. As a result, customers looking for motorcycles will need to consider the amount of money they have available seriously. Some people searching for motorcycles are seeking an affordable alternative. However, they have high criteria for the pleasing and build quality of the bike they buy, even if the price is modest. In this Fuzzy Analytic Hierarchy Process analysis, motorcycle brands are evaluated according to customer preferences, priorities, and financial limitations.

2. METHODOLOGY

Fuzzy AHP is a decision support method created to address problems by preparing a questionnaire. In this study, the questionnaire is given to two motorcycle-buying experts. The questionnaire result was computed using the fuzzy AHP method, and the pairwise comparison matrix was constructed. The consistency ratio was then computed, and if the result was less than or equal to 0.10, the pair comparison matrix was modified. If not, the pairwise comparison matrix is converted to fuzzy numbers to generate the triangular fuzzy number. The criteria were ranked after calculating the fuzzy geometric mean, fuzzy weight, and normalized weight.

3. RESULTS AND DISCUSSION

According to the normalised weight, Honda is the best motorcycle brand over Suzuki, Yamaha, and Modenas for daily commuting or work. The findings show that when buying a motorcycle, consumers are more affected by price. This study demonstrates the importance of considering finances, features, promotions, and motorbike kinds when deciding which motorcycle manufacturers to buy in Kota Bharu.

4. NOVELTY OF RESEARCH / PRODUCT

The AHP method, which has been extensively researched and modified throughout time, is thought to have been introduced by Saaty (2008) in his work "Decision Making with the Analytic Hierarchy Process." Based on previous work by Zadeh (1996), this study identified and analyzed a unique dynamic mechanism. Dweiri and Al-Oqla (2006) used the AHP model to choose the best material for the study's keys. The method was chosen by the researchers partly because it allows for reliable measurement of paired comparisons of options, which aids in minimizing decision-makers' inconsistent behaviour.

5. CONCLUSION

In this study, four criteria; financial, promotion, features, and motorbike type; are evaluated by fuzzy AHP decision-making while evaluating motorcycle brands. According to this report, price is more important to Kota Bharu motorcycle consumers than features. Financial weighs in at 0.5920 the most. Then came the 0.2439-weighted features. The category of motorcycles came in third with 0.1157 weight. The promotion has the least weight (0.0484). In terms of motorcycle transportation, Honda comes in first (0.3881). Suzuki came in second place with a 0.3029. With 0.2615 and 0.0415 points, Yamaha and Modenas are third and fourth, respectively.

REFERENCES

Holyoak, N., & Bray, D. (2015). Motorcycles in Developing Asian Cities: A Case Study of Hanoi. In *37 th Australasian Transport Research Forum*. https://www.researchgate.net/publication/282332097

Hussain, H., Ahmad Farhan, M. S., Radin Umar, R. S., & Dadang, M. M. (2005). Key Components Of A Motorcycle-Traffic System. *IATSS Research*, *29*(1), 50–56. https://doi.org/10.1016/s0386-1112(14)60118-7

Saaty, T. L. (2008). Decision Making with The Analytic Hierarchy Process. In *Int. J. Services Sciences* (Vol. 1, Issue 1).

Zadeh, L. A. (1996). *Fuzzy Logic = Computing with Words* * (Vol. 4). Computer Science Division and Electronics Research Laboratory. Dept. of Electrical and Electronics Engineering and Computer Science University of California Berkeley, CA 94720-1776, USA

Dweiri, F., & Al-Oqla, F. M. (2006). Material selection using analytical hierarchy process. In *Int. J. Computer Applications in Technology, 26*(4).