

## 1. Introduction

Tourism has become an important industry with considerable influence on economic growth [1]. Indonesia is one of the tourist destinations in the world owing to its cultural diversity and natural resources. [2]. Based on Law Number 10 of 2009 concerning tourism, there are 13 types of tourism businesses, one of which is a tour guide. According to [3], tour guides are people who combine a high standard of enthusiasm, knowledge, personality, behavior, and ethics to guide a group of people or individuals to important places while providing interpretation and commentary. Tour guides are known to play a significant role in the tourism industry.

Guidemu is a tour guide service provider that connects tourists with local tour guides through mobile applications. The application connects tourists to the tour guides selected by the system. However, the decision-making system in Guidemu still selects tour guides based on the shortest distance from the tourist destination. In this case, selecting a tour guide based on only one criterion is no longer efficient and is less than optimal. To achieve maximum performance, other relevant criteria must be considered.

To address this issue, a study was done to build a decision support system for selecting the best tour guide based on predetermined criteria using Multi-Criteria Decision Making (MCDM). The MCDM method is used to evaluate or select a limited number of alternatives, or to select the best one from a set of alternatives [4]. This method assesses and prioritizes the alternatives that best satisfy a given set of criteria. Criteria can be measures, rules, or standards used in decision-making [5].

The results of the decision-making on the selection of tour guides play an important role in achieving the goals of Guidemu in providing the best decisions not only for tourists but also for tour guides. Many decision-making problems have been solved using the MCDM approach, but very few studies have focused on the selection of tour guides. Research [6] has succeeded in building a decision-making system for the selection of tour guides using the MCDM method, namely simple additive weighting (SAW). However, the process of determining the criteria to the weighting of the criteria was not explained further, in addition, there was no expert involved in the decision-making process and any form of testing was not carried out on the proposed method. Therefore, this study aims to comprehensively explain the process of developing a decision-making system that focuses on the selection of tour guides in Guidemu.

Currently, several methods can be used to solve the MCDM problems. The technique for order of preference by similarity to ideal solution (TOPSIS) was selected because it has proven useful in solving many real-world MCDM problems and has been regarded as one of the primary methods in the decision-making process [7]. However, TOPSIS can only be used for criteria whose weights are known or calculated in advance [8].

However, determining criteria weights is a key element in MCDM problems. The weight of the criteria plays an important role in measuring the overall alternative preference [9]. Therefore, the recently introduced MCDM method, the best-worst method (BWM), was chosen because it can identify the optimal weight of a set of criteria based on the preferences of a single decision maker [10]. Furthermore, compared with similar weighting methods, this method is easier to apply and produces a significantly more consistent weighting result [11].

Consequently, the hybrid BWM-TOPSIS method was proposed for implementation in the tour guide selection system of Guidemu.