

Section 1 Introduction

Indonesia has a lot of potential in terms of nature and culture that can be developed into a tourist destination. With an increasing population, the need for goods and services is also increasing, including the need for recreation as a tertiary need [1]. Yogyakarta has many interesting cultural heritages and attractions. The cultural changes that occurred were the result of a mixture of prehistoric, Hindu, Buddhist, Islamic, and Dutch colonial cultures, which made Yogyakarta's tourist attractions so diverse [2]. There are 226 tourist destinations in Yogyakarta spread throughout the region, most of which are located in the city center such as the Yogyakarta Palace (Kraton Ngayogyakarta Hadiningrat), the Presidential Palace, and several museums [3], [4].

Based on the diversity of tourist attractions in Yogyakarta, tourists from outside Yogyakarta are not familiar with the information on tourist attractions in Yogyakarta. Tourists have needs and preferences when determining their travel destinations so a travel agent can assist in planning tourist visits. For backpackers who want to save money, travel agent services are very expensive. To make it easier for them to plan a tour, an application is needed that can recommend tourist visits within a few days. There have been several previous studies that have developed a recommender system that can produce a travel itinerary based on the needs of tourists in a few days [5-7].

A recommender system for travel itineraries requires an algorithm capable of solving the Traveling Salesman Problem (TSP). TSP problems can be solved with optimization algorithms. There are several optimization algorithms that are suitable for tourist route recommendation systems, such as Ant Colony Optimization, Genetic Algorithm, and Simulated Annealing Algorithm [8, 9]. In addition, to accommodate the needs of our users we use the Multi-Attribute Utility Theory (MAUT). By using the MAUT, the recommender system for tourist routes can evaluate and prioritize criteria according to the needs of tourists [5].

In this study, we propose an update in the form of adding user preference criteria. Users can customize tourist routes based on four additional pieces of information, i.e., 1) tourist routes with as many tourist attractions as possible visited per day, 2) tourist routes that minimize the budget, 3) tourist routes that visit popular places, 4) time to start and end the tourist visit. Based on these user preferences, the system generates an itinerary automatically.

The next section describes related work and methodology in developing a recommender system for routes. After that, we explain the experiment and the results obtained, finally, we explain the conclusion of our research.