

## **CHAPTER V**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1. Conclusions**

Based on the overall system testing, the results of this research can be concluded as follows:

1. The tourism bus management website for PT. Setio Budi Luhur Trans was successfully designed and built using the Laravel framework with an Agile approach. The system provides integrated features for managing bus data, customer data, and rental transactions within a single web-based platform. All processes that were previously carried out manually can now be managed digitally, ranging from recording bus fleet data, customer account registration and management, to the creation and monitoring of rental transactions.
2. The Extreme Gradient Boosting (XGBoost) algorithm was successfully implemented as a bus rental price prediction model and integrated into the system in real time. The model was trained using 196 historical data points, split into 85% training data and 15% testing data, with input variables consisting of travel distance, bus type, and season category. Evaluation of the model across four categories (Medium–Normal, Medium–Holiday, Big–Normal, and Big–Holiday) produced an average MAPE of 0.74%, an average MAE of Rp 25,584, and an average  $R^2$  value of 0.9934. These results indicate that the XGBoost model is able to predict bus rental prices with a high level of accuracy and is suitable for implementation as a core component of a machine learning-based pricing system.
3. The developed system has proven to help users obtain bus rental price estimates more quickly compared to the previous manual process. Users simply need to input pickup location, destination, date, and bus type, after which the system automatically calculates the distance and season category to generate an instant price estimate through the XGBoost model. This is supported by the results of the System Usability Scale (SUS) testing conducted on 30 respondents, which yielded a score of 85.4 on the user side and 95 on the admin side, both falling into the Excellent category and Grade A which demonstrating that the system is easy to use, efficient, and capable of replacing the time-consuming manual negotiation process with a price estimate obtainable within seconds.

## **5.2. Development Recommendations**

1. The dataset used in this research was sufficient to build a prediction model with good performance. Nevertheless, future research is encouraged to continue enriching the dataset by adding historical data from a wider variety of routes and time periods, so that the resulting model can become increasingly adaptive to various travel conditions that may not yet be represented in the current dataset.
2. The system currently developed supports two commonly used bus type categories in tourism bus services, namely Medium and Big. Future development could expand the range of available fleet categories.
3. The XGBoost algorithm used in this research has proven capable of producing price predictions with high accuracy. Future research could explore and compare other machine learning algorithms such as Random Forest, LSTM, or SVR, in order to compare the performance of each algorithm for the case of long-term tourism bus rental price prediction.