MAJOR RECOMMENDATION SYSTEM AT SMAN 3 TUBAN USING DECISION TREE METHOD

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ABSTRACT

Choosing a major at the Senior High School (SMA) level is a crucial stage that greatly affects students' future educational direction and careers. At SMAN 3 Tuban, the process of determining majors (Package A, Package B, Package C, Package D, Package E, Package F, and Package G), particularly for students, still faces challenges in processing academic grade data and evaluating student interests quickly, objectively, and automatically. Therefore, this study aims to design and develop a web-based Major Recommendation System that can provide accurate placement decisions to assist the Guidance and Counseling (BK) department and the school..

This intelligent system was developed by implementing a Machine Learning algorithm, namely the Decision Tree C4.5, which functions to classify students' historical datasets into a decision tree and placement rules. The software development applied the Waterfall method with a decoupled architecture. The user interface (Frontend) was built using the React library, while the server-side and data processing logic (Backend) were developed using the Node.js runtime environment, with MySQL as the database.

The result of this research is the operation of an interactive and dynamic major recommendation website portal. Based on the software functionality testing using Black-Box Testing, all system features were declared valid and running according to the expected functionalities. Furthermore, the reliability testing of the

Decision Tree C4.5 algorithm using a Confusion Matrix yielded classification performance with an accuracy rate of]%, a precision rate of [Y]%, and a recall of [Z]%. The high values of these evaluation metrics prove that the developed system is feasible and effective to be used as a decision support tool for student major placement at SMAN 3 Tuban.

Keywords: *Decision Tree C4.5, Node.js, React, Major Recommendation System, SMAN 3 Tuban.*