Implementation of a Convolutional Neural Network (CNN) Using the MobileNetV2 Architecture for Early Dermatitis Screening at R.T. Notopuro Regional Public Hospital, Sidoarjo

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ABSTRACT

Dermatitis is one of the most common skin diseases and can affect people of all age groups. Delays in recognizing the symptoms of dermatitis may lead to worsening skin conditions; therefore, a medium that can support rapid and easily accessible early screening is needed. This study aims to develop an Android-based dermatitis screening application by utilizing the Convolutional Neural Network (CNN) method with the MobileNetV2 architecture as a skin image classification model.

The system development process includes the collection of skin image datasets, preprocessing stages consisting of image resizing to 224×224 pixels and data normalization, MobileNetV2 model training, model conversion into TensorFlow Lite format, and model implementation within an Android application. The developed application is equipped with features such as user registration, login, skin image classification, examination history, anamnesis, consultation with administrators, doctor schedules, and hospital information. Firebase is used as the backend service to support user authentication and data storage.

System testing was conducted using functional Testing and convenience Testing methods. The results of functional Testing indicate that all application features functioned according to the designed specifications and achieved valid status. Meanwhile, the Application Usability Testing results, conducted using the USE Questionnaire involving 30 respondents, yielded a Application Usability score of

82.30%, which falls into the Excellent category. These results indicate that the application demonstrates a high level of usefulness, ease of use, ease of learning, and user satisfaction.

Based on the results of this study, it can be concluded that the Android-based dermatitis screening application utilizing the CNN method with the MobileNetV2 architecture was successfully developed and is feasible to be used as a practical supporting tool for early dermatitis screening through smartphone devices.

Keywords: *Dermatitis, Convolutional Neural Network, MobileNetV2, TensorFlow Lite, Android, USE Questionnaire*.