

## Android-Based Dental and Oral Health Diagnostic Expert System

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### Abstract

Dental and oral health is one of the most crucial things for human health. If it is taken cared properly then all foods will be absorbed optimally and the human body will have all the nutrition needed. Otherwise, if it is not taken care properly then it will affect the health condition of a human body. Lack of awareness of Indonesians about their dental and oral health had caused many infection cases which leads to teeth structural damage. In 2013, Health Research and Development Agency had done a survey based on interview's result. They found that 25,9 percent of people in Indonesia were having issues with their dental and oral health in the last 12 months. Among them, there was 68,8 percent people who had not taken any treatments. To resolve this problem, an expert system with android platform is made to diagnose dental and oral diseases. The research methodology used is forward chaining method. Expert System Shell used is CLIPS which then adopted into Android application.

Kata Kunci: Expert System, Forward Chaining, Android, Dental and Oral Diseases.

### 1. Introduction

Oral and dental problems are one of the most-complained diseases by Indonesian people. Dental and oral problems in Indonesia which developed from dental caries occupy the highest rank of 45.68% and belong to the top ten of diseases suffered by people (Kementerian Kesehatan, 2014). Based on the age category, the youth suffered more caries compared to the age of 45 and above (Norfai & Rahman, 2017). This high number of dental diseases in Indonesia is caused by a lack of public awareness to maintain dental and oral hygiene. Oral and dental health is a crucial factor in an entire human body. If the health of one's oral or dental is bad, then the impact to general health is profound. For example, toothaches, sprues or even cavities will trouble oral's activity and lose one's appetite which probably will affect another body part's health. There are still many people who have not realized the importance of maintaining oral and dental health so that they became unaware of the impacts and side effects that can emerge by not maintaining their oral and dental health. Besides that, there is also a group of people who recognized it but did not understand it so they did not take care of their oral and dental health properly (Hestieyonini, Kiswaluyo, E.Y, & Meilawaty, 2013).

Based on the data and information center of the Indonesian Ministry of Health, a simple analysis was carried out to see the level of distribution of dentist health workers at the Health

Center. The result of a simple analysis showed that most health centers in 33 provinces are still troubled with lack of dentist. 3 provinces which "lacking" the most were West Papua, Papua, and North Sulawesi. Compared to the Indonesian population, the dentist ratio from 2009-2013 tends to be around 4-5 dentists per 100.000 population (Kementerian Kesehatan, 2014).

From the data obtained above, it can be seen that the level of public awareness of dental and oral health is still low while the distribution of dentists in Indonesia is also still lacking. Therefore, this research was made with the goal of being able to help the Indonesian people, especially who live in areas that have a lack of dental medical personnel's that are able to identify and diagnose dental and oral diseases. Hopefully, this expert system can provide enough diagnoses and understandings in the matter of the diseases suffered so that prevention, as well as further check-ups, can be done. This expert system is also useful to help medical personnel's such as dentists or dentist' assistants to make a decision when diagnosing their patients.

### 2. Research Methodology

Expert system is commonly known as a *Knowledge-Based System* which means a computer application with the aim to facilitate decision-making or problem-solving in a specific matter. One of the most important components needed for an expert system is knowledge and analytical