

ABSTRACT

This study develops an expert system for early diagnosis of Diabetes Mellitus (DM) using forward chaining and certainty factor methods. The main issue is the need for an accurate tool to identify DM early, as current diagnosis rely on manual medical procedures that require time and resources. The system accepts symptom inputs from users and outputs the detected DM type. Early detection is vital to prevent long-term complications, but limited access to medical services often leads individuals to remain unaware of their condition. Furthermore, most existing systems do not differentiate between DM type 1 and type 2, underscoring the need for a more specific and efficient approach. Forward chaining is used to process rules in the knowledge base, while the certainty factor calculates confidence levels based on symptoms and expert input. The system's main contribution is determining Measure of Belief (MB) and Measure of Disbelief (MD) values based on expert confidence in linking symptoms with DM types. Performance evaluation used a confusion matrix to measure diagnostic accuracy and the User Experience Questionnaire (UEQ) for interface assessment. The system achieved 96.7% accuracy, and all UEQ scales were rated "Excellent," showing it is both accurate and user-friendly for early DM diagnosis.

Keywords: *Artificial Intelligence, Certainty Factor, Diabetes melitus, Expert System, Forward Chaining.*