

CERTIFICATE NO : **IACDSETM /2026/C0826811****Predicting Diabetes and Guiding Drug Treatment Using Knowledge Engineering****Chavan Amruta Suhas Shweta**

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ABSTRACT

Accurate prediction of diabetes and proper guidance of drug treatment are essential for preventing long-term damage to the heart, kidney, eye, and nerves. Many existing computer models focus only on prediction or only on treatment. They also depend mainly on statistical patterns and give little explanation of how a decision is reached. In medical practice, both diagnosis and medicine choice must follow clinical knowledge, patient history, and safety limits. Knowledge engineering can capture this knowledge in rules, facts, and relationships that a system can apply in a clear and consistent manner.

This thesis develops a knowledge engineering approach to predict diabetes and guide drug treatment in one integrated framework. First, medical knowledge will be collected from standard guidelines, published drug information, and expert consultation. This knowledge will be represented as concepts and rules related to risk factors, diagnostic thresholds, types of diabetes, first-line and second-line medicines, dosage conditions, contraindications, and possible adverse effects. Second, a reasoning module will use patient data to infer diabetes status and then suggest a treatment path.

The prediction stage will consider demographic, clinical, and laboratory features to identify people at risk or already affected by diabetes. The treatment-guidance stage will recommend suitable drugs according to the predicted condition, associated diseases, and safety rules. If a medicine is not suitable because of kidney disease, heart failure, allergy, or interaction with another drug, the system will exclude it and suggest an alternative. Each output will be supported by the rules used, so the result remains explainable.

The proposed system will be tested on available diabetes datasets and reviewed with medical experts. Evaluation will include prediction performance, usefulness of treatment suggestions, and clarity of explanations. The main contribution of this work is a simple, knowledge-driven computer model that links diabetes prediction with safe drug guidance. Such a model can support doctors and health workers in making faster, more consistent, and more transparent treatment decisions.

Keywords: *Knowledge Engineering; Diabetes; Drug Treatment; Expert System.*