

**IMPLEMENTASI SISTEM PAKAR GIZI MENGGUNAKAN METODE
FUZZY LOGIC DAN DECISION TREE UNTUK DIAGNOSA STATUS
GIZI DAN REKOMENDASI POLA HIDUP SEHAT
PADA GENERASI MUDA**

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ABSTRAK

Penelitian ini bertujuan untuk merancang dan mengimplementasikan sistem pakar gizi berbasis web yang mampu mendiagnosis status gizi serta memberikan rekomendasi pola hidup sehat pada generasi muda. Sistem ini dikembangkan dengan mengintegrasikan metode *Fuzzy Logic Mamdani* dan *Decision Tree* untuk menangani data gizi yang bersifat tidak pasti, ambigu, dan linguistik. Variabel input yang digunakan meliputi Indeks Massa Tubuh (IMT), frekuensi kondisi klinis 5L (lemah, letih, lesu, lelah, dan lalai), penurunan berat badan, serta frekuensi makan per hari. Metode *Fuzzy Logic Mamdani* digunakan untuk menghasilkan diagnosa lokal pada masing-masing kategori indikator melalui proses fuzzifikasi, inferensi, agregasi, dan defuzzifikasi menggunakan *Maximum Membership Principle* (MMP). Selanjutnya, hasil diagnosa lokal diproses menggunakan metode *Decision Tree* untuk menentukan diagnosis akhir status gizi dan rekomendasi pola hidup sehat yang sesuai. Sistem dikembangkan menggunakan bahasa pemrograman Python dengan *framework* Flask dan basis data SQLite, serta menerapkan metode pengembangan *Waterfall*. Hasil pengujian menggunakan *Black Box Testing* dan *User Acceptance Testing* (UAT) menunjukkan bahwa sistem mampu berjalan sesuai kebutuhan fungsional, menghasilkan diagnosis status gizi yang konsisten dengan pengetahuan pakar, serta memberikan rekomendasi pola hidup sehat yang relevan dan mudah dipahami oleh pengguna. Dengan demikian, sistem pakar gizi ini dapat digunakan sebagai alat bantu pendukung keputusan dalam pemantauan dan edukasi status gizi pada generasi muda.

Kata kunci: *Decision Tree, Sistem Pakar, Status Gizi, Fuzzy Logic Mamdani, Pola Hidup Sehat, Generasi Muda.*

IMPLEMENTATION OF A NUTRITION EXPERT SYSTEM USING FUZZY LOGIC AND DECISION TREE METHODS FOR DIAGNOSING NUTRITIONAL STATUS AND RECOMMENDING HEALTHY LIFESTYLE PATTERNS FOR THE YOUNG GENERATION

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ABSTRACT

This study aims to design and implement a web-based nutrition expert system capable of diagnosing nutritional status and providing healthy lifestyle recommendations for the young generation. The system was developed by integrating the Fuzzy Logic Mamdani and Decision Tree methods to handle nutritional data that are uncertain, ambiguous, and linguistic in nature. The input variables used in this system include Body Mass Index (BMI), frequency of clinical symptoms known as 5L (weakness, fatigue, lethargy, tiredness, and inattentiveness), weight loss, and daily meal frequency. The Fuzzy Logic Mamdani method is applied to generate local diagnoses for each indicator category through the processes of fuzzification, inference, aggregation, and defuzzification using the Maximum Membership Principle (MMP). The resulting local diagnoses are then processed using the Decision Tree method to determine the final nutritional status diagnosis and appropriate healthy lifestyle recommendations. The system was developed using the Python programming language with the Flask framework and SQLite database, following the Waterfall development method. The results of system testing using Black Box Testing and User Acceptance Testing (UAT) indicate that the system functions properly according to the defined requirements, produces nutritional status diagnoses consistent with expert knowledge, and provides relevant, clear, and easily understandable healthy lifestyle recommendations for users. Therefore, this nutrition expert system can be utilized as a decision support tool for nutritional status monitoring and health education among the young generation.

Keywords: Expert System, Nutritional Status, Fuzzy Logic Mamdani, Decision Tree, Healthy Lifestyle, Young Generation.