

ABSTRAK

Kualitas layanan Wifi kampus berpengaruh langsung terhadap kelancaran kegiatan akademik mahasiswa. Namun di Universitas Trunodjoyo Madura (UTM), keluhan mahasiswa masih bersifat informal dan belum diolah secara sistematis sebagai dasar keputusan perbaikan. Penelitian ini bertujuan mengembangkan kerangka pengambilan keputusan perbaikan Wifi kampus yang mengintegrasikan suara mahasiswa melalui *Natural Language Processing* (NLP) dan *House of Quality* (HoQ). Data dikumpulkan melalui kuesioner dan keluhan teks bebas dari 302 mahasiswa. Keluhan diolah menggunakan *Latent Dirichlet Allocation* (LDA) yang menghasilkan empat topik utama, kemudian diturunkan menjadi enam *customer Requirement*. Anotasi data divalidasi dengan Cohen's Kappa (rata-rata 0,893), lalu klasifikasi dilakukan dengan *Logistic regression* yang menghasilkan *F1-score* 0,622–0,918. Kebutuhan tersebut diterjemahkan ke dalam tujuh *Technical Requirement* pada HoQ. Hasilnya, pengurangan *packet loss*, peningkatan SNR, dan peningkatan RSSI menjadi prioritas teknis tertinggi dengan bobot relatif 21–22%. Setelahnya dilakukan korelasi Spearman antara bobot teknis HoQ berbasis survei dan bobot teknis dari sinyal NLP bernilai $\rho = 1,00$, sehingga NLP dapat menjadi alternatif atau pelengkap survei konvensional. Kerangka keputusan yang menggabungkan skor dampak berbobot dan usaha implementasi menetapkan manajemen beban dan kapasitas jaringan sebagai prioritas tertinggi (skor 24,342). Prioritas berikutnya adalah pengendalian interferensi dan penertiban AP liar (11,535), pengaturan ulang penempatan dan konfigurasi *Access Point* (11,484), serta pembangunan peringatan dini kesehatan jaringan dan sistem *ticketing* (4,050).

Kata kunci: House of Quality, Natural Language Processing, Latent Dirichlet Allocation, Logistic Regression, Wifi kampus, pengambilan keputusan

ABSTRACT

Campus Wifi quality directly affects the smoothness of students' academic activities. However, at Universitas Trunodjoyo Madura (UTM), student complaints remain informal and have not been systematically processed as a basis for improvement decisions. This study aims to develop a decision-making framework for campus Wifi improvement that integrates the student voice through Natural Language Processing (NLP) and House of Quality (HoQ). Data were collected through questionnaires and free-text complaints from 302 students. The complaints were processed using Latent Dirichlet Allocation (LDA), which yielded four main topics that were then translated into six customer Requirements. Annotation reliability was validated with Cohen's Kappa (average 0.893), and classification was performed using Logistic Regression, achieving F1-scores between 0.622 and 0.918. These Requirements were translated into seven technical Requirements in the HoQ. As a result, reducing packet loss, increasing SNR, and increasing RSSI emerged as the highest technical priorities, with relative weights of 21-22%. A Spearman correlation was then computed between the survey-based HoQ technical weights and the NLP-derived technical weights, yielding $\rho = 1.00$, which indicates that NLP can serve as an alternative or complement to conventional surveys. The decision framework, which combines weighted impact scores with implementation effort, ranked network load and capacity management optimization as the top priority (score 24.342). It was followed by interference control and rogue AP enforcement (11.535), Access Point placement and configuration optimization (11.484), and network health early-warning with a ticketing system (4.050).

Keywords: *House of Quality, Natural Language Processing, Latent Dirichlet Allocation, Logistic Regression, campus Wifi, decision-making*

