ABSTRACT

The rapid growth of internet users in Indonesia has increased the demand for efficient broadband services, challenging telecommunications companies to enhance operations and customer satisfaction. One of the main challenges is the manual handling of customer complaints, which slows response times and increases the workload of service agents. This study proposes a microservices architecture that integrates Optical Character Recognition (OCR) powered by Artificial Intelligence (AI) and Natural Language Processing (NLP) with the Integrated Customer Management System (ICMS) and Knowledge Management System (KMS). This solution automates data extraction from Standard Operating Procedure (SOP) documents in PDF format, accelerates AI-based solution retrieval, and improves customer interaction efficiency.

The architecture is developed using The Open Group Architecture Framework – Architecture Development Method (TOGAF ADM), covering Vision, Business, Information Systems, and Technology Architectures to ensure alignment between corporate strategy and infrastructure. The implementation of microservices enables interoperability through APIs, scalability, and more flexible system integration. OCR technology plays a crucial role in transforming SOP documents into structured data, allowing the system to automatically recommend solutions based on customer complaint analysis automation.

The findings indicate that integrating AI, OCR, and microservices within the ICMS-KMS framework significantly enhances operational efficiency and service quality. The AI-powered recommendation system accelerates response times, improves solution accuracy, and reduces reliance on manual searches. Digitalizing customer interactions supports the company's digital transformation, minimizes manual workloads, and enhances agent productivity. Consequently, this architecture strengthens the competitiveness of telecommunications companies in meeting customer expectations in the digital era.

Keywords— ***artificial intelligence, enterprise architecture, enterprise system integration, microservices, optical character recognition, TOGAF***