IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, September 2025
Impact Factor: 7.67

# A Comprehensive Review of Natural Language Processing and its Applications in Chatbots

**Dr. B. Anuja Beatrice[1], Abhirami Sivaram K H[2], Dharaneesh R L[3]**
Head and Associate Professor[1]
BCA Students[2,3]
Sri Krishna Arts and Science College Coimbatore[1,2,3]
anujabeatriceb@skasc.ac.in[1], abhiramisivaramkh23bca003@skasc.ac.in[2],
dharaneeshrl23bca016@skasc.ac.in[3]

**Abstract**: *The goal of the crucial artificial intelligence (AI) subfield of natural language processing (NLP) is to improve human-machine communication. As digital interfaces have advanced quickly, chatbots have become one of the most popular uses of natural language processing (NLP), allowing for real-time, human-like communication across a range of industries. The architecture, features, applications, advantages, and future potential of natural language processing (NLP) and its incorporation into chatbot systems are all highlighted in this paper. The study explores the various kinds of chatbots, including rule-based, AI-driven, and hybrid models, and the useful functions they perform in a variety of sectors, including banking, healthcare, education, and customer support. It also looks at the difficulties with data privacy, system scalability, and language comprehension. The study provides insights into how NLP-driven chatbots are changing the face of digital communication and decision-making by analyzing recent developments and prospective breakthroughs. The results highlight the increasing demand for systems that are moral, open, and flexible in order to guarantee significant human-computer interactions.*

**Keywords**: Natural Language Processing (NLP), Artificial Intelligence (AI), Human-Machine Communication, Chatbots, Real-Time Communication, Rule-Based Chatbots, AI-Driven Chatbots, Hybrid Models, Data Privacy, Digital Communication

Copyright to IJARSCT
www.ijarsct.co.in

DOI: 10.48175/568