INFORMATICS INSTITUTE OF TECHNOLOGY

In Collaboration with

UNIVERSITY OF WESTMINSTER

Online Monthly Bus Ticketing System Integrated with Chatbot

A Dissertation by

Isuru Udana Kuruppu

W1867045/20210172

Supervised by

Mr. Salitha Perera

Submitted in partial fulfilment of the requirements for the BEng (Hons) in Software Engineering at the University of Westminster.

May 2025

Abstract

Getting and renewing monthly bus tickets by traditional means demands a long waiting period because people have to queue up while the system operates during limited hours. The current inefficiencies become worse due to the absence of both real-time support and an adaptable intelligent system. An Online Monthly Bus Ticketing System linked to a Chatbot system serves users by processing natural language input through Named Entity Recognition (NER) and deep learning response generation.

A system using Python as its backend whereas the prototype operated through command-line interface (CLI). Structured data extraction such as source, destination and travel date can be performed by the BERT + LSTM encoder-decoder based chatbot system from unstructured user input. The project team deleted payment gateway integration together with route selection functionality when data availability along with resource constraints emerged. The existing system operates with English queries to generate ticket fares through location-based distance calculation using a simple formula.

The implemented system cut booking time ranges from 90% reduction to the point where users saw positive results in 85% of survey responses while maintaining 92% accurate query processing. User assessment results show that the automated system possesses strong capabilities to boost monthly ticket booking efficiency and accessibility through its approach which combines intelligent automation with user-friendly interfaces.

- **Subject Descriptors:** Computing methodologies → Artificial intelligence → Natural language processing → Information extraction

- **Keywords**: NLP, NER, Chatbot, Digital ticketing