

# DEVELOPMENT OF AN AI-BASED CHATBOT SYSTEM TO AID CUSTOMER RETENTION IN SMALL MEDIUM ENTERPRISES



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## Abstract

Chatbots are conversational agents that provide access to information and services via natural language processing.. SMEs (Small And Medium Enterprises) and individuals are yet to be able to harness the capabilities of the chatbots((Følstad et al., 2021).

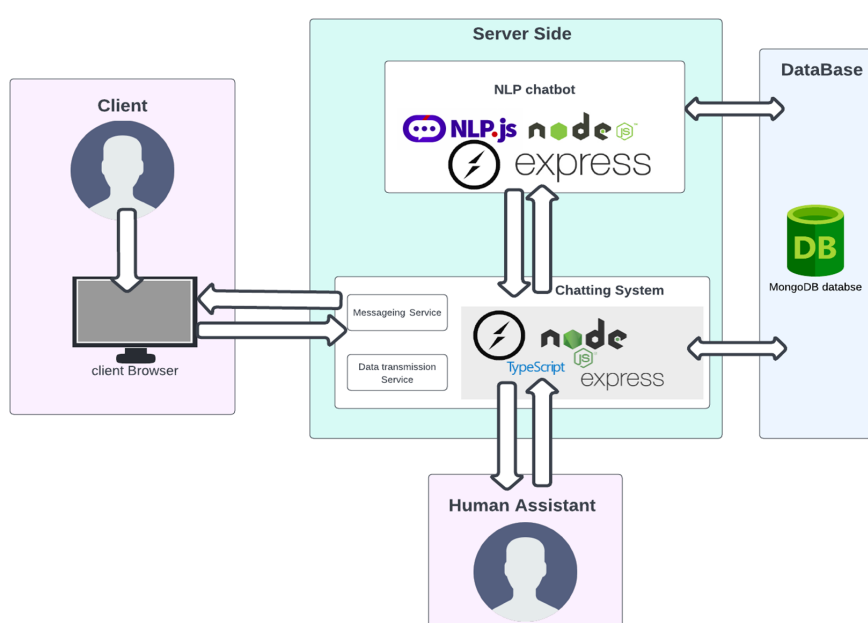
These SMEs fail to be available, and in turn lose customers due to some problems such as lack of dedicated staff to communication, lack of proper internet presence and the inability to respond promptly to customer complaints and questions. Also, SMEs find it hard to appropriately channel their product or services toward their market demands as it is very costly to gain business intelligence from conversations with customers and partners.

A chatbot system using BERT (Bidirectional Encoder Representations from Transformers) model is developed for constant communication between the customer and SME

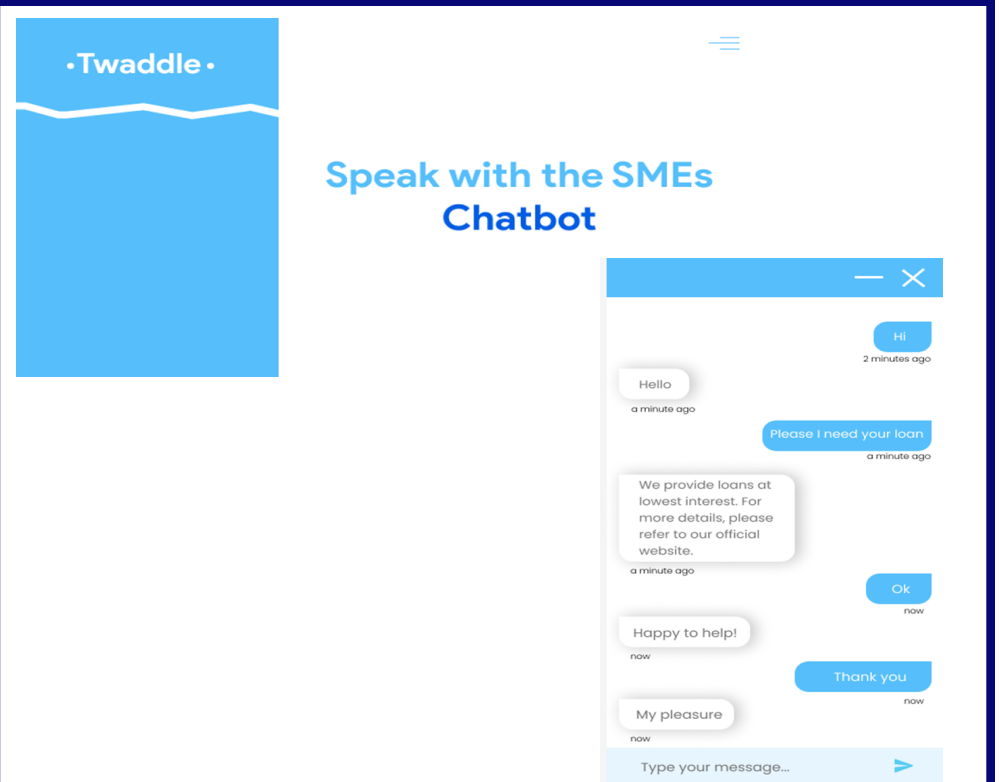
## Methods

The customer to the Small and Medium Enterprise is the system's primary user. These users connect to the system using a Uniform Resource Locator (URL) which enables the users to communicate with the chatbot over a chatting system. The messages are sent to the server via a real-time framework called Socket.io which utilizes web sockets. The data reaches the server and the server fulfills three major tasks which include the data service, messaging service, and feeder service. The data service is carried by the server performing creation, reading, updating, and deleting of data with the database. The messaging service allows for the user and chatbot as well as a human assistant to communicate over the system. The transmission service is responsible for the transmission of user chats and messages to the chatbot for processing and response. It is also responsible for a scenario where the chatbot is yet to have an answer to a question asked by the user and connects the user to a human assistant which will then answer user questions and chats will be saved in the database for further training of the chatbot to adapt to new question and inquiries with the accurate answers.

## System Architecture



## Result



After training and testing the chatbot model using a javascript-based technology (NLP.js), a user interface was implemented using React.js. Figure 2 shows the home page of the chatbot and figure 3 shows a conversation with a customer. Hence, from the above the purpose of this study was achieved to aid prompt interaction with the customer and hence, customers are retained. Also, from consistent conversations with customers stored in the database, products or services can be directed toward the market demands.

## Conclusion

This study has been able to accomplish its objectives by implementing a chatbot system that can aid customer retention for SMEs by keeping the communication channel between the user which is the customer and the SME alive. Thereby growing the customers that such SME has and increasing its reachability to the world.