



SUMMER INTERNSHIP PROJECT REPORT

WhatsApp ChatBot

Version 1.0

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1. Introduction:

The purpose of this project report is to provide a detailed overview of the summer internship at Espina IT Solutions, Doha-Qatar.

Hamad International Airport is a prominent international airport located in Doha, Qatar. As a busy hub for air travel, the airport handles a large number of passengers daily. The internship focused on developing a chatbot to assist passengers at Hamad International Airport with their inquiries, provide relevant information, and offer guidance throughout their journey.

In the subsequent sections of this project report, the methodology, implementation details, results, conclusions, and future enhancements of the internship project will be discussed in further detail.

2. Objectives:

The primary objectives of the summer internship project at Espina IT Solutions encompassed various technical aspects and aimed to deliver a comprehensive and effective chatbot system.

The specific objectives of the project were as follows:

- Develop a chatbot to provide assistance to passengers of Hamad International Airport.
- Enable text and voice-based interactions with the chatbot via WhatsApp.
- Utilise TensorFlow for natural language processing to generate appropriate responses.
- Convert voice messages to text and text to voice messages.
- Implement multilingual support
- Integrate the chatbot with Chatwoot to handle conversations and provide a dashboard view in Webex for real agents to communicate with users.

3. Methodology:

The systematic approach ensured the fulfilment of project objectives while maintaining a focus on user requirements and technological efficiency.

The following steps were undertaken to achieve the project objectives:

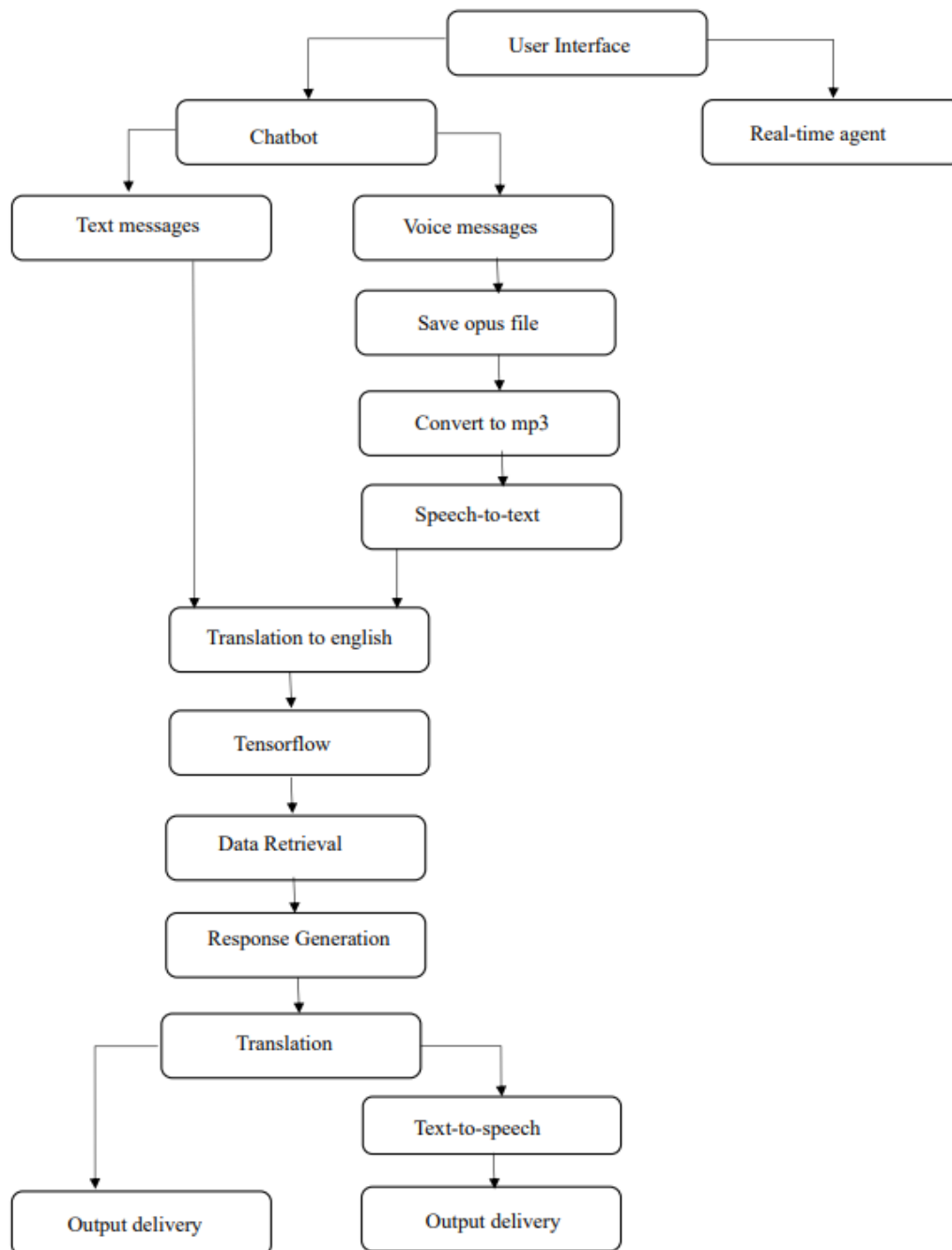
3.1. Requirement Analysis:

The project started with a thorough analysis of the requirements and expectations of the chatbot solution. This involved understanding the needs of passengers at Hamad International Airport, identifying the types of queries and information required, and determining the desired functionalities of the chatbot.

3.2. System Design

Based on the requirements analysis, a comprehensive system design was created. This included defining the architecture of the chatbot solution, outlining the modules and technologies to be used, and determining the integration points with external platforms like WhatsApp, Chatwoot, and Webex.

3.3. Workflow



3.4. Development

The development phase involved implementing the designed system. Node.js was used as the primary backend programming language for its efficiency and scalability. TensorFlow was integrated to handle natural language processing tasks, enabling the chatbot to understand user queries and generate appropriate responses. The necessary modules and APIs were integrated into the system.

3.5. Text Message Processing

To handle text messages, the chatbot utilised TensorFlow for natural language processing. Text inputs received via WhatsApp were passed through the TensorFlow model for analysis, generating appropriate responses based on the trained dataset. The responses were then sent back to the users as text messages.

3.6. Voice Message Processing

For voice messages, the ffmpeg module was used to convert opus files to mp3 format. The whisper-nodejs module was used to convert the voice content in mp3 format to text. The converted text was then processed through the TensorFlow model, generating a response. The response was converted back to voice format using the simple-tts-mp3 module and sent to the user as an audio reply.

3.7. Multilingual Support

To enable multilingual support, the chatbot integrated the bing-translate-api module. User queries in different languages were translated to a common language (english) for processing by the TensorFlow model. The responses generated by the model were translated back to the user's preferred language using the same module, ensuring effective communication in multiple languages.

3.8. Database Implementation

MongoDB was used as the database management system to store flight and passenger data. The database was designed to efficiently store and retrieve information, allowing the chatbot to provide accurate and up-to-date flight details and passenger assistance.

3.9. Integration with Chatwoot and Webex

To manage conversations and interactions, the chatbot was integrated with Chatwoot, a customer communication platform. Chatwoot provided a dashboard view where chatbot conversations could be tracked and managed. Additionally, the dashboard view of Chatwoot was made accessible in Webex, allowing real agents to view and participate in conversations with users who preferred human assistance over the chatbot.

3.10. Testing

Testing was done throughout the development process to ensure the functionality, accuracy, and performance of the chatbot solution. Feedback and improvements were incorporated based on the testing results.

4. Results

The developed chatbot successfully achieved the objectives set for the project. It provided assistance to both text and voice-based queries in various languages. The TensorFlow model effectively processed user input and generated appropriate responses in real-time. The integration with Chatwoot and Webex facilitated seamless communication between users and real agents when required.

5. Conclusion

The summer internship project at Espina IT Solutions resulted in the successful development of a chatbot to assist passengers at Hamad International Airport. The use of Node.js and TensorFlow, along with various supporting modules, allowed for efficient text and voice-based interactions. The integration with Chatwoot and Webex ensured a smooth transition between automated and human-assisted communication. The project provided valuable experience in working with cutting-edge technologies and solving real-world challenges in the field of natural language processing and customer service.

6. Future Enhancements

While the developed chatbot met the project objectives, there is room for further enhancements and improvements. Some potential areas for future development include:

- Increasing the accuracy and understanding of the TensorFlow model by training it on a larger and more diverse dataset.

- Enhancing the voice-to-text and text-to-voice conversion modules to improve accuracy and naturalness.
- Conducting user testing and gathering feedback to refine the chatbot's performance and identify areas for improvement.

By addressing these areas, the chatbot can be further enhanced to provide an even better user experience and become an invaluable asset for assisting passengers at Hamad International Airport or similar contexts.

7. References:

- Introduction to Tensorflow for Deep Learning : Udacity course
- <https://www.npmjs.com>
- <https://www.w3schools.com/nodejs/>
