

Remote Customer Service Support System With Automatic Response AI And Human Switching

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Abstract—In the past, to reduce the cost of customer service, chatbots have been utilized to automatically respond to common inquiries from customers, with human staff only called upon when more complex questions arise. However, specific methods for integrating a dialogue system using avatars and human staff in a VR space have not been clearly defined. In this research, we propose a customer service system that transitions from automatic responses to human staff in a VR space. We will produce evaluation content that simulates actual operations in a virtual store and assess the system's usability from the perspectives of both customers and store staff, as well as the system's ability to effectively transition between automatic responses and human staff.

Keywords—VR, Remote Service, AI

I. INTRODUCTION

In response to the COVID-19 pandemic and the pursuit of novel working arrangements, the adoption of remote customer service is expanding in sectors necessitating client interaction. As an important technology related to customer service, research is currently underway on chatbots that can automatically respond to customer inquiries. Despite significant improvements in conversational ability, chatbots alone are still incapable of handling all customer service tasks. To address this limitation, a hybrid system is implemented in which chatbots initially answer questions and provide guidance when responding to inquiries via chat. In instances where a problem arises that the chatbot is unable to handle, a human staff member intervenes to resolve the situation. Previous research has demonstrated the effectiveness of this operational method [1].

II. SYSTEM OVERVIEW

In this research, our objective is to develop a system that employs virtual staff members to cater to customers' inquiries in a virtual store using voice conversations in a VR environment. Each human staff is responsible for multiple virtual stores. To ensure a coherent customer experience, our proposed system seamlessly integrates human staff members to take over the conversation when virtual staff members are unable to respond adequately. If the virtual staff member is unable to handle the inquiry, the customer is directed to call a human staff member. Furthermore, the system is designed to collect and accumulate dialogue data that will be used to improve the responsiveness

and efficiency of the virtual staff members. Staff and customers can talk to each other by voice.

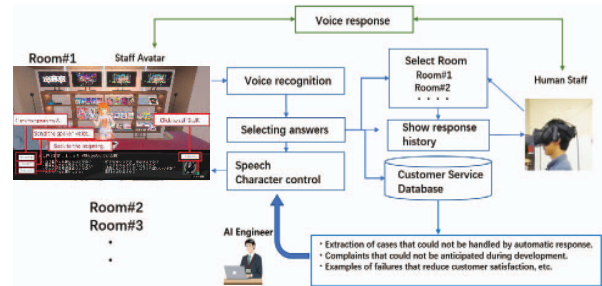


Fig. 1. The switch between AI and human staff.

III. PRELIMINARY EXPERIMENT

The results of the research suggests that the system can be learned quickly with a simple one-minute video explanation. The system was successful in initiating a dialogue with the customer, and was able to clearly identify questions that the virtual staff could not answer, facilitating a smooth handover to human staff in the virtual space. The high scores achieved suggest that the system was effective in this regard.

IV. CONCLUSION

This research presents the results of a questionnaire survey based on role-plays simulating actual operations, demonstrating the successful implementation of a remote avatar customer service system that combines virtual and human staff in VR-based remote avatar customer service. As a future prospect, we aim to analyze and utilize the conversation data collected through long-term operation of the system, with the goal of expanding the range of responses that can be provided by the virtual staff.

REFERENCES

- [1] A. Følstad and M. Skjuve, 'Chatbots for customer service: user experience and motivation', in Proceedings of the 1st International Conference on Conversational User Interfaces, New York, NY, USA, 2019, pp. 1–9. doi: 10.1145/3342775.3342784.