CuCoMaG - Group Reflection Support in Role-Playing Environments

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Abstract: In this paper we present the application CuCoMaG (Customer Complaint Management Group reflection), a web-based role-playing environment for training customer complaint management in combination with a group reflection support tool. The application consists of two different parts. The first part is a role-playing environment in which the user assumes the role of an employee in a web shop and has to solve the problem of an AI-controlled complaining customer through a chat conversation. The second part is a tool, which supports an expert or trainer in a group discussion process by offering visualizations and analyses of the user's performances. Separating the actual role-playing application and the review session can provide a different perspective and thereby enhance the learning process. The here presented work is the result of a student master project conducted at the University of Duisburg-Essen.

Keywords: customer complaint management, virtual role-play, group reflection, intelligent support, multi-agent architecture

1 Introduction

Customer psychology has always been an important aspect in marketing because the customer's emotions play an important role in the success of service. Negative emotions generally trigger complaining behavior among the customers [LS97]. Handling customer complaints properly has become an increasingly important social skill and is subject of professional training especially in companies, markets and multinational corporations. As a result, advanced customer complaint resolution skills are required. This paper presents a web-based application to train customer complaint management skills. The simulated scenarios allow learners to try different problem-solving strategies in a virtual environment. To increase the learning effect of this virtual role-play, it is followed by a group reflection phase based on an automated analysis of the user's performances. Reflection, and group reflection in particular, is a successful tool to improve learning processes [JMM93]. The reflection tool presented herein is based on a dashboard design providing a variety of functions.

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2 Virtual Role-playing Environments

This work is building on the research of Buhmes et al [Bu10], Emmerich et al [Em12] and Ziebarth [Zi14], all focusing on 2D and 3D role-playing environments for training specific social skills following a scenario-based learning approach. The training scenarios include apprenticeship job interviews, conflict management and patient-centered medical interviews. While all scenarios feature at least one player and a chat bot, they focus on different aspects, such as scaffolding and evaluation [Bu10], collaboration [Em12] and gamification [Zi14]. The distinctive feature of the here presented approach is the explicit group reflection support.

3 Chat Application Design & Implementation

CuCoMaG consists of the *chat environment* application and the group reflection application. In the chat environment it is the user's task to handle customer complaints by communicating with the complaining customer. The chat environment utilizes a *chat bot*. The advantage of using a bot instead of face-to-face role-play lies in the higher degree of standardization for the conversation. Because customer support often happens in a chat environment this application offers a realistic setting for the customer support scenario.

Since there is an infinite number of ways for the user to phrase a statement, *sentence openers* are offered to the user. After choosing a sentence opener the user can also enter *free text* to elaborate on his statement. The sentence openers allow the bot to understand the gist of the user's message, while the possibility of free text input facilitates a more natural conversation. In order to cover all possible states of the conversation and every user input, a dialog model was constructed. Based on this model, the chat bot was implemented using AIML, an XML-based chat bot language[2].

The chat application utilizes a score system designed to evaluate the user´s performance based on certain specifications. The actions and inputs of the user are analyzed by the backend which was implemented using a multi-agent architecture consisting of 11 agents. The multi-agent architecture ensures a flexible and adaptive application design. For the communication between the agents a blackboard system was used. The agents analyze the user's behavior for characteristics such as rudeness, aggression and politeness. A score system uses all measured characteristics of the user to evaluate the performance. The score for each step of the chat conversation together with all characteristics measured by the agents are stored for later use in the group reflection tool. Thus the chat application supplies the data for all users which can then be presented using the tool which is described in the next chapter.

[2] See http://www.alicebot.org/aiml.html

4 Group Reflection Tool

Reflection can be defined as a learning method that allows people to learn from their own behavior [Mo04]. This method can be extended by reflecting in groups. The group reflection approach allows different perspectives and solutions for the same problem or situation. This application facilitates the learning effect of the chat environment with a group reflection support tool.

The tool was developed for use in a collaborative training center environment. An expert or trainer is supposed to lead the discussion and the tool allows him or her to present and compare the performances and results of different users of the chat environment. For the group reflection tool, a *dashboard* design was chosen. The trainer can view the *chat conversation* of each user, enriched with annotations from the analysis agents. Different visualizations of the user's performances in the form of a *bar chart* or *line chart* simplify the comparison of the participants. The dashboard also includes a *notepad* which offers the trainer the possibility to take notes. The notes, which can also include annotated parts of the chat conversation can be exported to generate a *report* for each user.

Summarizing CuCoMaG is a web-based application that combines the benefits of a virtual learning environment with the advantages of generating knowledge through reflection in a group.

The flexible multi-agent architecture enables easy adaptation to new scenarios and more customer types, e.g. a customer whose problem cannot be solved easily, or an aggressive customer who insults the user.

(To test the CuCoMaG application visit https://github.com/doberstein/CuCoMaG)

Literature

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