Chat-bots for Customer Interaction in Opera Houses Opera Information and Ticket Bot

Seminar Paper

Kerem Baktiroglu 11948556,
Michael David Bures 01063995,
Şükrü Görkem Okur 01001474,
Dusan Popovic 01651258,
Simon Strasser 01550838

Advisor: Univ.-Prof. Dr. Stefan Schmid

VU Cooperative Systems
Faculty of Computer Science
University of Vienna

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Abstract. The world is developing fast, especially regarding the use of automated systems or technologies in people's daily lives where automated systems become more popular day-by-day. Considering the valuable time of people and mixing with current pandemic situation, attending social activities became almost impossible. However, there can be a solution so as to cope with the problem. In this seminar paper, a solution approach regarding these problems is exhibited. The Seminar Paper is about an automated Telegram chatbot that helps people so as to ease taking information about opera performances. More particularly, users can get the program information and even start to purchase a ticket for the Opera. This prototype chatbot aims to support the understanding of opportunities and risks in the use of these digital assistants in customer interaction.

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1 Introduction

This section briefly explains the topic of chat-bots in the context of customer service and interaction to the related reader. In following sections, motivation of project will be introduced, challenging issues are mentioned and finally technical parts are explained.

The interfaces for businesses to communicate with customers have changed in the past years of increasing digitization [1]. One of the tools that was boosted by technological advancements like artificial intelligence and machine learning is chat-bots. From a business perspective there come several questions with the opportunities of chat-bots like in which way bots should be integrated in a product and service portfolio. From a technical point of view questions such as how to make a chat-bot's behavior more natural and conversational arise.

On the other hand, despite struggling issues that would arise, using chat-bots creates a great opportunity to the related users. Using a chat-bot especially in social events, leads people attend them much more than ever [2]. However, when it is dealt with the struggling issues, it is seen that user experience somehow puts the chat-bot system in a complex status. For instance, misspelled words by users or misunderstanding of the context of the system responds by users may cause errors and can result in system or user got stuck. So as to deal with the problem, developers need to improve the coding part. Additionally, badly designed chat-bot GUIs also cause a problem which may cause a disuse of the system by the related users [3].

Since an increasing number of consumers is available via instant messaging services and setting-up such an application in Facebook Messenger, WhatsApp or similar services is getting easier, even business owners with no or low interest in taking overly complicated tools for these purposes, can benefit from chatbots [4]. These developments boost the further expansion of chatbots especially for business that interact with their customers. An overview about strengths, weaknesses, opportunities and threats in this field is the topic of this seminar paper.

2 Chat-bots in Customer Interaction

The literature emphasizes that a conversation with an artificial assistant (i.e. a chat-bot) is ought to be as close to conversation with a natural person as possible [5]. This is stated as an essential aspect to convince people to use chat-bots, especially the elderly.

Artificial Intelligence in customer interaction does not always mean that customers are more satisfied than with other ways of communication [6]. Cases where self-

service technology is preferred are useful examples to find out what has maybe been done wrong when AI for service automation was introduced.

The further part of this section will provide an overview about digital assistants, in particular chat-bots, in marketing activities as well as opportunities and difficulties in this area.

2.1 Creative and Cultural Industries

There are lots of cultural activities, which digitization process can involve such as theaters, art galleries, museums or any other activities that are related to traditional cultural activities. In these activities, artificial intelligence plays an important role day-by-day thanks to the developing technology [7]. With this aspect, mainly chat-bot's are very effective to use so as to ease the process of work. However, it can sometimes be observed that, chat-bots have trouble with understanding users or the developing process. That is why chat-bots need to be trained well in terms of data-sampling, analysis, updating training data, managing large hierarchies of intents and writing compelling conversational content[2].

2.2 Opera Houses

Implementing a chat-bot can be very effective for opera houses in terms of observing the performance times, current and future programs, costs of those performances or names of the artists that are involved in performance. Due to the fact that an employee of the opera house cannot remember every kind of information that were mentioned above, implementing a chat-bot may handle the problem. On the other hand, digitization process also will reduce the paper wastage. For example, if customer/user wants to learn something, (s)he can just write to the chat-bot and the chat-bot responds immediately after without latency or providing a paper to the user. Furthermore, it can be seen that, some of artificial assistants may do the entire work such as question-answer process and also buying and reminding the ticket process.

3 Chatbot's contribution to economy

Using chatbots may reduce the costs of firms and customers. Especially for the sectors that sell/book tickets or reserve places for an event, may take advantage of it. To illustrate, the person, who does not use a chatbot, needs to go to the place in person to get information or to a ticket counter so as to buy a ticket. However, occasionally it might not be possible due to force majeure. From this

point, chatbots may help to learn the information and buying ticket without personally going there. The most important thing is there would not be a time wasting by going to the related place and this time would be contributed to the economy indirectly [8].

Additionally, chatbots have an influence on companies' marketing activity. Customers expect digital agents to provide personalized and optimized functionality combined with quick responses to ensure a better user experience and value for the user than traditional ways of interaction with customers [9]. In this context, chatbots can help to develop a strong brand promote customer loyalty as well as help as a data source for service improvment.

The overall potential of Artificial Intelligence and chatbots in particular are rated high [10]. An increasing number of large businesses and brands especially in the service sector are going to promote their bot application for customer interaction since reportedly 80 % of Gernation Z (i.e. people born in the 90s and younger) use some kind of bot (voice/text) for information search prior to a purchase. Room for improvement is left by motivating users to actually perform a purchase and not only gather information which is also part of the implementation presented later in this report. Another opportunity is to use the user's personal data that is either explicitly provided (e.g. the bot asks for the user's current location) or can be collected via a user account and through data mining.

4 Threats in Chatbots

Before considering the threats in a chatbot, it is necessary to understand that if data is retrieved from a user, there is always a risk of data breach or data phishing. It can be seen that, some chatbots needs personal information such as identity, e-mail, password or credit card information. Regarding this fact, data need to be protected by developers [2].

From a user's viewpoint, it is essential that personal data that is handled with care and stored and transferred securely. Otherwise users can be dissatisfied with the experience they have when using a chatbot or even refuse to use it at all [11]. The difference between what users say about their trust in online services regarding data and privacy security can diverge from their actual behavior [12]. The just mentioned literature suggests that users are more likely to disclose sensitive data (e.g. credit card information) to machine agents than to human agents they interact with. This is important for the implementation goal of this seminar paper, because *Opera Information and Ticket Bot* can also include at a later state the opportunity to buy tickets which makes sharing payment method information necessary.

In *Opera Information and Ticket Bot* project, Telegram is used as platform to develop a chatbot. Using Telegram chatbot prevents data leak with some methods such as messages are heavily encrypted and can self-destruct. To illustrate, prior to a message being transmitted over a network using a transport protocol, it is encrypted in a certain way, and an external header is added at the top of the message which is: a 64-bit key identifier and a 128-bit message key. A user key together with the message key defines an actual 256-bit key which is what encrypts the message using AES-256 encryption. The message key is defined as the 128 middle bits of the SHA256 of the message body (including session, message ID, etc.), including the padding bytes, prepended by 32 bytes taken from the authorization key. Multipart messages are encrypted as a single message [13].

5 Pushback against Chatbots

Even though chatbots themselves offer many benefits, as discussed earlier in the paper, one thing is still holding them back from becoming much more widespread, the lack of trust and acceptance of a lot of people. Studies have shown that chatbots and AI can increase sales up to four times more than an inexperienced worker. This, of course makes sense, the bots do their job perfectly, every time and always deliver the most optimal result to the customer. They do not have bad days and have no personal feelings that they could potentially let get in the way of assisting their customers. Still, a study from Temple University has shown that sales can drop up to 80% if a customer is made aware that they would be interacting with a chatbot or some other form of artificial intelligence [14]. According to the study, people who were informed about the presence of chatbots, felt that they could not be as knowledgeable as a real person and were thus reluctant to make a purchase.

The underlying issue is our natural mistrust to anything that is new or not entirely familiar. No matter how advanced a bot is, if we know that we are dealing with a machine, the first thing we focus on is that we are dealing with something that is not human. There is certainly a plethora of advanced artificial intelligence programs out there, some companies even design their bots to imitate certain human behavior when dealing with emotional customers, for example [14]. So a conclusion could be drawn that there is not much more that can be done from a design perspective to make the acceptance of chatbots more widespread, time will tell whether or not we start becoming more trusting towards new and innovative technologies.

6 Own Implementation

The chatbot called *Opera Information and Ticket Bot* is designed for the related users, who want to take information about opera performances on a related date or information about opera itself. The bot can also direct the user to the ticket buying site. The *Opera Information and Ticket Bot* can be mounted by "/start" command. Although, the threshold command "/start" can be written by user, the chatbot also starts without giving any command.

Secondly, the chatbot asks the user to enter which day's program they want to know more about. After that, the user should reply "Today" or "Tomorrow" so as to exhibit the today's or following day's performances. After that, the chatbot replies the related program of opera performance of the requested day that was already given by the user. Subsequently, the user is asked by chatbot to enter the plot, composer, price information or discount information. Replying plot or composer directly gives the information about these topics. However, if the user replies "price" or "discount", the chatbot provides the user with a link to the related ticket buying site.

Additionally, user can reply only one answer to one question asked by the chatbot. If the user wants to go back to the previous answer by chatbot, (s)he may reply "/back". Also, if the user stuck into the chatbot and needs help, (s)he can write "/help". Finally, the user can restart the chatbot with writing "/restart" command which makes chatbot to return back, and write "/bye" in order to end the communication process with the chatbot. The *Opera Information and Ticket Bot* prototype is exhibited below in Figures 1 and 2. Figure 1 shows the start of a conversation and the user request to show possible commands. Figure 2 displays the request for information about Giuseppe Verdi who is the composer of Macbeth which was chosen as opera of interest.

6.1 Alternative ways of Chatbot Implementation

During the implementation of *Opera Information and Ticket Bot* the question came up how the back-end should be built. More precisely, we had to choose a source of information, e.g. hardcode it to a file the bot reads from or to implement requests to APIs. The latter approach is tempting for a more advanced version of a chatbot like the one discussed in this paper. After consultation with the supervisor Prof. Schmid we decided to keep the bot on a rudimentary level for this project report which means that we used hardcoded information that the chatbot fetches.

Using APIs in the backend of a chatbot opens new opportunities and can make an assistant (i.e. chatbot) much more powerful and flexible. There are several sources for APIs that allow to request data of various topics from different sources, e.g.

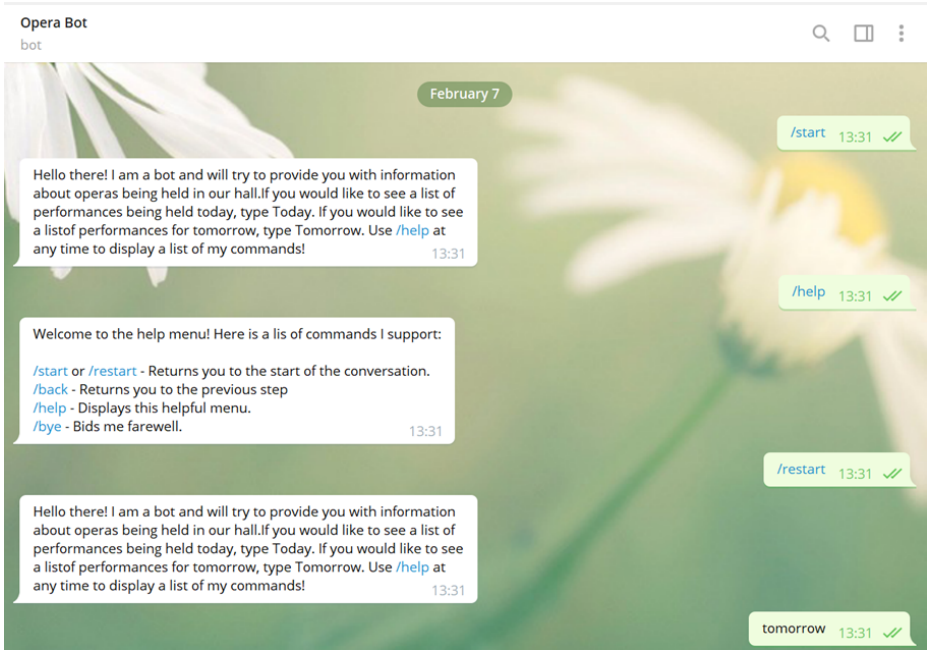

Fig. 1. Chatbot Start Screenshot

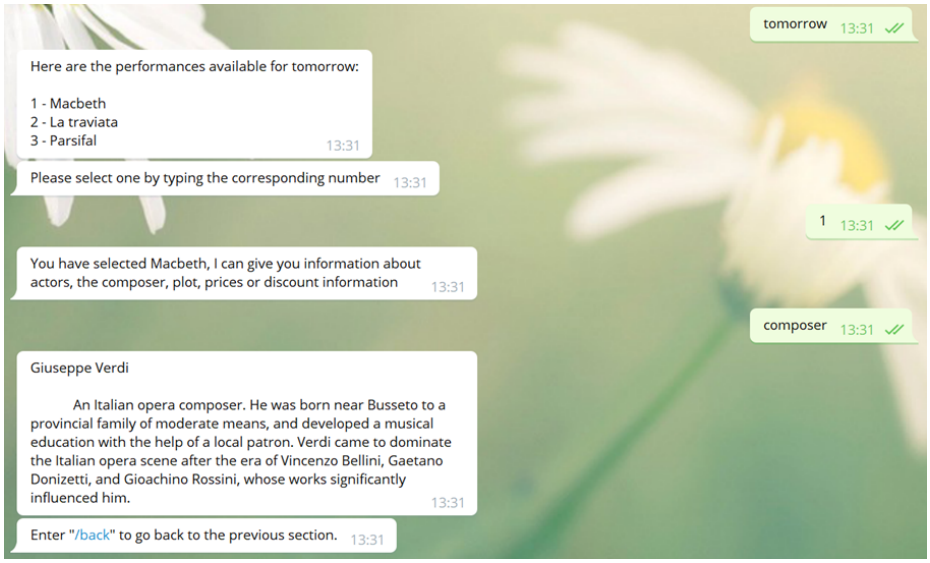

Fig. 2. Chatbot provides Composer Information

rapidapi.com. A possible way to implement an opera information bot would be to use APIs of opera houses and ticket offices in order to get information e.g. by HTTP requests. These thoughts came up after reading introductory tutorials like the one by Dzaky Widya Putra [15].

The purpose of the chatbot at this stage is to give an idea how a chatbot in the opera sector could look like and what functionality it could include with the aid of a working prototype. Furthermore, the current prototype can also be useful for developers to understand how users interact with the bot in order to draw conclusions and learn for further improvement of the application. Of course a more advanced version that uses e.g. Web Services in the background to fetch information can provide valuable information about usage even better and contribute to continuous improvement.

7 Conclusion and Outlook

To sum up, it can be seen that usage of chatbots in business, especially in applicaton fields where users expect a useful support and flawless interaction with a bot (e.g. social events), might help related users to ease the process of fetching information and save valuable time. Although there may be some struggles that occur during the development and deploying, a basic chatbot in a platform can both be written and read also by junior developers. Such a chatbot can on the other hand already provide good service to the user.

The more advanced a chatbot is, the more value it can create for a business. If the chatbot will be able to access data from a larger pool e.g. via HTML requests to an interface, it is can play an important role as a powerful tool in customer relation management. Due to the increasing number of chatbots used and more developed AI in the background that is about to enter the market, a strong boost in the field of chatbots and similar digital assistants in every-day life can be assumed.

Moreover, chatbots can be considered reliable for users to use. When the service design concept is well done, usability would be high enough for related users and does not cause any errors during the usage. Since user experience is important to consider and beta users may find errors, deployed chatbots should be kept up-to-date and maintained continuously by developers. In *Opera Information and Ticket Bot* project and other projects that were examined and evaluated during the final presentations of Cooperative System lecture, the main problem is to handle the user experience in a correct way. This leads us to understand that, after developing a chatbot, alpha and beta tests should be done so as to cope with the problems which would probably occur during the usage of a chatbot.

8 Contributions

- Baktiroglu -Introduction; Chat-bots in Customer Interaction; Chatbot's contribution to economy; Threats in Chatbots; Own Implementation; Conclusion and Outlook
- Bures - Introduction; Chat-bots in Customer Interaction
- Okur - Chatbots in customer interaction; Threats in Chatbots
- Popovic - Pushback against Chatbots; Own Implementation
- Strasser - Alternative ways of Chatbot Implementation; Conclusion and Outlook

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