STUDENT SESSION

CONVERSATIONAL SURVEY CHATBOT: USER EXPERIENCE AND PERCEPTION

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Abstract:
The aim of the paper is to explore two directions, one is the use of conversational chatbots for the purpose of data collection, and the other is the analysis of user experience in the usage of chatbots when it comes to various customer services. Regarding survey chatbot, the paper discusses existing obstacles of static online surveys, and through the presented steps of chatbot design, demonstrated the ease of designing and distributing chatbot for research purposes. On the other hand, through the conducted research, which included 200 respondents from the Serbian market, research shows that chatbots are not so widely used (only 44% have used chatbot), and even 88% of respondents would use human rather than Chabot. However, through analysis of existing research that involved other markets, results have shown that most respondents feel more relaxed and have fun when using a chatbot. Still, the main obstacle, in general, is the lack of social capabilities of chatbots.

Keywords:
Conversational Agent, Online Survey, Chatbot, Chabot Builder, Landbot.

INTRODUCTION

Today, with the advent of AI-powered technologies, there are several methods to collect data. One traditional way is to conduct a static online survey, which is still widely used. Another way is by using chatbots, or lately biometric sensors that provide precise insights into human behaviour such as Eye Tracking, Facial Expression analysis, EEG, ECG and other techniques. However, these newer biometric technologies are still not so accessible. Therefore, in this paper, we will focus on chatbots and demonstrate how researchers can use existing chatbots platforms to create their survey. Besides, we have used a conversational survey chatbot to investigate the user experience and perception of today chatbot capabilities.

The lack of static online surveys is the difficulty to interpret users' natural language responses and manage complex interactions. [1] For example, users are usually offered predefined answers, and on questions like "What do you think about the service?", users' responses could be:

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DOI: 10.15308/Sinteza-2021-322-327

"I've never used it", "I am satisfied" etc. If free-text format is offered, then the problem is how to interpret answers, since natural language processing (NLP) algorithms are not so easy task. Even if a system has implemented NLP algorithms on free-text responses, the problem is how to manage further interactions with users.

Besides these difficulties, the main problem today is that users are not willing to respond to online surveys anymore, or they will spend a max of 5 min answering the questions regardless of the size of the survey. [2] The main reasons are decreasing human attention span, and due to the bad overall survey design (relevance, format, structure and so on), the respondents get bored very fast. [3] For example, grid questions cause 80% more drop-out than any other question format.

On the other hand, chatbots are changing the patterns of how humans interact with computers today. [4] Chatbots are conversational software systems based on artificial intelligence (AI) techniques with which users interact through natural language dialogue, by text or voice. [5]

Today, the growth of chatbots in customer service, education, health, travel, entertainment, personal assistance and other areas, has changed how companies engage with their customers, students with learning platforms, tourists with travel systems and many other applications.

A chatbot survey or "conversational survey" is an online survey presented in a form of conversation where respondees, instead of answering static questions, are engaged in a conversational exchange with a bot persona.

While chatbots were initially designed to mimic human-to-human communication, current chatbots are typically task-oriented, assisting users to complete a certain task or achieve specific goals. For example, Siri or Alexa dialogue agents can provide concrete answers, such as to find restaurants, pay bills, make phone calls or texts etc.

Despite the benefits, there is a lot of issues. Recent research shows that chatbots still fail to meet users' expectations because of the lack of social capabilities [4]. Also, people are afraid of chatbot could use some of their private data for unknown purposes. People are also expecting that chatbot can answer questions like a human. Besides, people are usually dissatisfied when they realize that a chatbot can provide them with false answers.

In this paper, we have designed a chatbot survey to investigate user experience when interacting with it, and in general, to find out do they still prefer human over Chabot agent. For chatbot design, we have used the open-source chatbot framework "Rasa.ai". Dialogue flow is directed by Rasa Core. In this study, we have used Landbot platform to create the rule-based chatbot. The study involved 200 respondents from Serbia, aged 18-55 years which have responded to 12 questions by using a chatbot survey.

The paper is structured as follows: first, a relevant background of chatbots and related studies are presented. In the next section, the process of chatbot design using an open-source chatbot builder is shown. Finally, the research results of the survey chatbot are analysed, which are followed by a conclusion and further perspectives.

2. LITERATURE REVIEW

Human-computer interaction (HCI) field implies technologies that allow usage of natural language among human and computers.

An AI-based chatbot is a conversational system that is designed to emulate human communication with capabilities to understand natural language, identify meaning, emotion, intention, and provide meaningful responses.

In the era of cognitive computing, personal smart devices come with pre-installed conversational agents (CAs), such as Siri, Microsoft Cortana, Google Assistant, Alexa, and others. Based on the mode of interaction, CAs can be categorized into [6]:

1. Speech-based CA (e.g., Siri, Alexa)
2. Text-messaging based CA (e.g. Messenger bots, Google Assistant)
3. Multimodal CA.

The first developed CA was a text-messaging based agent, called ELIZA, that emerged in 1966 from MIT. ELIZA worked on simple declarative rules to mimic the responses of a psychotherapist in a therapy session. When text messaging gain popularity in 2015, chatbots have received significant attention. Over 30.000 chatbots have been developed on Facebook's Messanger Bot platform. [7] The recent interest in chatbots can be attributed to the development of advanced AI techniques, especially with a combination of machine learning and deep learning algorithms.

Chatbots can be classified into various categories based on their purpose, mode of interaction, usage, design techniques, knowledge domain etc. According to the design mode or level of understanding the type and purpose of the conversation, chatbots can be broadly classified based on the following criteria [8]:

1. Interaction mode (text or voice/speech-based)
2. Chatbot application (task or non-task oriented)
3. Rule-based or AI (Machine or deep learning)
4. Domain-specific or Open-domain.

According to the purpose, chatbots can be grouped into the following categories [8]:

1. Service chatbot – designed to respond to customer requests or queries.
2. Commercial chatbot – designed to streamline purchases or other customer behaviours.
3. Entertainment chatbot – designed to engage customers with games, movies, sports, favourite brand, and other events.
4. Advisory chatbots – designed as recommendation systems, provide suggestions etc.

A chatbot can be classified as [9]:

1. Task-oriented chatbots – assist the customer to complete certain tasks (e.g. find location), by using a supervised or unsupervised approach.
2. Non-task-oriented chatbots – focus on customer conversation to find the right solution or to entertain.

Nuruzzaman & Hussain (2018) proposed taxonomy of the Chatbot application, divided it into four groups, such as [10]:

3. Goal-based chatbot – setup to have short conversations to get information from the user to complete the task.
4. Knowledge-based Chatbot – access the knowledge from the underlying data sources.
5. Service-based Chatbot – provide personal or commercial services.
6. Response Generated-based chatbots – based on what action they perform in generating the response.

Instead of answering static questions when conducting a traditional online survey, when using chatbot survey respondents are more engaged in conversation, and have more fun. Some advantages of using survey chatbots are [10]:

- Free the users' email inbox
- Transform the user experience into something more enjoyable
- Higher survey response rates
- React in real-time (for example, in the middle of the survey chatbot can offer discount voucher)
- Analyze conversation flow and follow customer behaviour throughout the questionnaire.

Radziwill & Benton (2017) provided quality attributed of chatbots and conversational agents, according to the quality assessment method. [11]

3. RELATED WORKS

Kim et al. (2019) conducted a 2 (platform: web vs. chatbot) x 2 (conversational styles: formal vs casual) experiment. The results show that participants in the chatbot survey provided higher-quality data. [3]

In the research of Xiao et al. (2020), 300 participants took a typical online survey on Qualtrics, and the other 300 interacted with an AI-powered chatbot to complete a conversational survey. Results show that chatbot drove a significantly higher level of participant engagement and better quality responses measured by Gricean Maximus in term of informativeness, relevance, specificity and clarity. [1]

Lee et al. (2020) revealed that chatbots are a low-cost, effective tool that supports people's self-disclosure. They run a study with 47 participants that were divided into three groups to use different chatting styles. The results show that chatbot self-disclosure also had a positive effect on participants enjoyment over the study period and improved perceived intimacy. [12]

Colace et al. (2018) have contributed to the chatbot prototype in the education domain. The purpose of the chatbot is to provide support to university students on some IT courses. Generally, students find that chatbot is easy to use and it is user friendly, and that is simple and effective. [13]

Folstad & Brandtzaeg (2020) analysed users' experiences with chatbots. [7] They conducted a questionnaire study that involved more than 200 chatbot users. Participants reported a set of positive experience, and usage of chatbots on different platforms: Messenger (79%), Skype (54%), Kik (38%), Viber (12), Slack (10%) and Telegram (4%). However, 65% of respondents reported that using a chatbot weekly or daily, 48% of them reported using a chatbot for 3 or more years, and 40% of respondents had experience with Google Assistant, according to (Folstad&Brandtzaeg, 2020). [7]

In the study "Why people use chatbots", authors Brandtzaeg & Folstad have investigated people's motivations and reasons for using chatbots. Conducted research, that involved 146 participants, aged 16-55, reported that productivity is the main motivational factor. Chatbots help users to obtain timely and efficient assistance. Besides, other motivational factors are entertainment, social and relational factors, and curiosity. [14]

In the research paper, titled "Millennials: attitude towards chatbots" by Cicco et al. (2020), 193 Italian millennials participated. The study suggested that millennials are the ones that definitely will give a chance to AI and chatbots. [15]

4. STUDY METHOD

4.1. CHATBOT DESIGN USING OPEN-SOURCE CHATBOT BUILDER

For designing conversational software, the open-source framework called Rasa.ai was used. [16] Dialogue flow is directed by Rasa Core and that corresponds to the following intentions (rasa.com) [17]:

1. Greeting (User greets chatbot)
2. Affirm (User confirms the chatbot statement)
3. Deny (User rejects chatbot statement)
4. Thankyou (User expresses his thanks)
5. Inform (User informs the chatbot about an entity)
6. Byebye (User exits the chat)

Today there are many no-code platforms that chatbot development makes an intuitive and easy task. In this study, we have used Landbot to create the rule-based chatbot.

With the Landbot platform, two main types of conversational assistants can be created [18]:

1. NLP chatbots – use Landbot's Dialogflow (API.AI) integration. This type of chatbot is ideal for creating an assistant for WhatsApp, plain text messages or another messaging platform with a limited user interface).
2. Rule-based chatbots - user can decide about his/her path (Fig. 1).

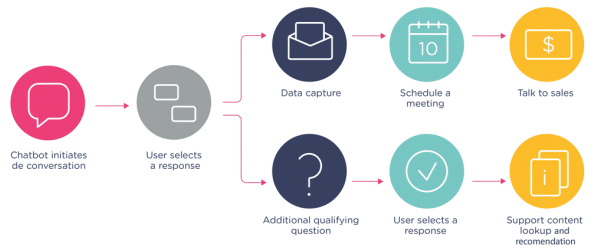

Fig. 1. Example of a rule-based chatbot decision tree [19] (Source: https://landbot.io/chatbots)

With Landbot also conversational application, that consists of rich user interface (UI) elements and combine NLP with rule-based elements, can be created.

Process of designing Landbot conversational chatbot include [20]:

1. **Choose the type of channel** - After setting up the chatbot builder account, which is free, and selected the "Build a Chatbot" option, the next step is to choose the type of channel. Available options are Website, Facebook Messenger, WhatsApp, or any messaging platform with Application Programming Interface (API).
2. **Choose the template of start from scratch** – Chatbot for this survey has been made from the beginning.
3. **Optimization of the Welcome Message** – personalisation of the welcome message can incorporate text or media messages such as images, gifs, videos etc.
4. **Adding the first sequence** - The main point of designing a chatbot is to connect questions and answers.
5. **Preview** – in any step the user experience and quality of the connections can be checked.
6. **Chatbot Branding customization** – including design the theme, choose the background colour scheme, select the logo and avatar, choose the fonts.
7. **Publish, share with a link or embed a chatbot on the website** – select embed options (full page, popup, embed or live chat).

After the design phase, another step is to send a chatbot survey to participants addresses via Facebook, Twitter, e-mail or WhatsApp. In this survey, chatbots are created using WhatsApp.

4.2. DATA COLLECTION

Data are collected by using the WhatsApp channel. A chatbot survey was distributed to randomly selected people. Among 200 respondents, there were students and employees, aged from 18 to 55 years. Participants responded to 12 questions by using a chatbot survey.

In the Landbot platform, under the section "Users", the answers of the respondents can be tracked. In the section Metrics, the results of the chatbots can be analysed.

4.3. RESULT ANALYSIS

This study aims to understand users experience and perception when interacting with chatbots. After reviewing the results of the research, we came up with unexpected results, and some of them will be presented below.

On the question "Do you know what a chatbot is?", 87% of participants said Yes, and 13% responded "No" (Fig. 2).

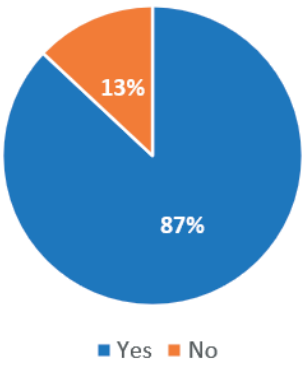

Fig. 2. Results of the question "Do you know what chatbot is"

On the question "Have you ever chatted with a chatbot?", only 44% have used it, and 56% did not (Fig. 3).

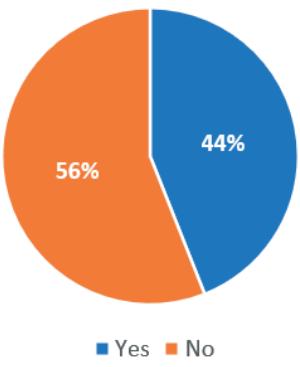

Fig. 3. Results of the question "Have you ever chatted with a chatbot?"

On the question "Would you use a brand again if you knew that they do not have a human agent?", 48% said that they would, 35% is not sure, and 17% wouldn't (Fig. 4).

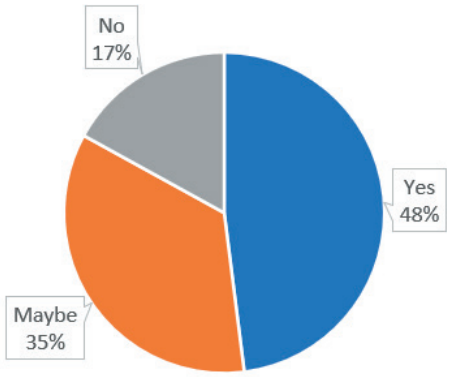

Fig. 4. Results of the question "Would you use a brand if you knew that they do not have a human agent?

However, on the question "Would you rather receive help from a chatbot or human agent even if you have to wait for a human agent?", surprisingly 88% of respondents said that they rather prefer a human agent (Fig. 5).

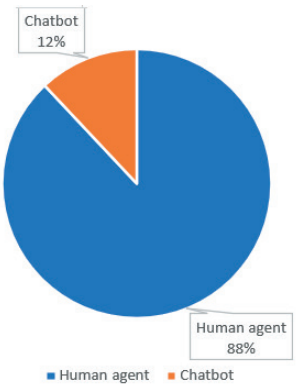

Fig. 5. The main result of the research

Most respondents explained that they have more trust in humans. Besides, the advantage of human agents is a natural and confidential way of talking. They also said that human can, logically, understand their needs.

On the other side, a smaller percentage of respondents said that chatting with the chatbot is just an easier and better way to get information since human agents are usually very busy with a lot of calls.

5. CONCLUSION

Conducting online survey by conversational chatbots, have never been so accessible, and easy to design. One of the main purposes of this paper is to demonstrate the design steps of a chatbot survey by using the free Landbot platform. Another purpose is to investigate the user experience when interacting with chatbots.

Although it is easier today than ever to create a chatbot for different needs, this study, which is applied to the Serbian market, shows that there is still dissatisfaction and mistrust when using chatbots. When it comes to other markets, research shows that chatbots are more interesting, available, enjoyable, effective and simple to use. However, in general, the pain point of existing chatbots are still missing social characteristics that cohere with users expectations, avoiding frustration and dissatisfaction. However, research shows that regarding conducting a survey it is preferable to create a conversational survey chatbot instead of a traditional, web or email survey.

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