# THE USE OF CHATBOTS ON WEBSITES IN PRACTICE

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**Abstract:** The use of chat bots is a novelty in web development. Its popularity is increasing rapidly. The aim of this paper is to show the frequency of using chatbots on web sites in Serbia. Therefore, an analysis of 98 websites with domains from Serbia which advertise cosmetic products or services is conducted to find out how often such websites include chatbots. The results show that chatbots are rarely used on web sites in Serbia. In order to make the use of chatbots more popular, a new lecture with topics on planning and creating chatbots is included in the subject *Practicum* for Information technology and Web design students in The Higher Technical Education School of Professional Studies in Novi Sad, Serbia. A short description of the aforementioned lecture is given as well.

**Key words:** Chatbot, chatbot service, Snatchbot, rebot.me, decision tree, web development

## 1. INTRODUCTION

Chatbots are programs built in order to communicate with people over all over the internet through text messages. In other words, chatbots enable an automated way of communication, (The Startup, 2019). Chat bots can be published on web sites and social networks in order to attract and retain users. There are many reasons why people like using chatbots. First of all, people like to try novelties. Also, chatbots can help users to finish some business like booking hotels, food ordering or getting cosmetic advices online at any time of the day, even on weekends. In other words, they represent online customer assistant, (Krunić et al., 2019). Customers save their time, since they can get information immediately. This certainly increases their satisfaction. Using chatbots for customer support is cheaper than hiring workers, (Sloan, 2019). According to (Smallbizgenius, 2019) using chatbots can decrease operational cost up to 30%. Besides, chatbots can have many conversations at the same time, which is not the case with human workers, (Chatbots magazine, 2017). This is the reason why more and more companies decide to start using chatbots on their web sites. According to a prediction published at (Smallbizgenius, 2019), 85% of customer interaction will be handled without human agents by 2021. Similar, in (Business insider, 2016) a survey which included 800 managers from companies around the globe is described. The results show that 80% respondents claimed that they already use or have the aim to use chatbots for their business.

This paper is organized as follows. Section 2 provides a description of chatbots and chatbot services which can be used for the creation of chatbots and their implementation on web sites. Section 3 gives a survey on the frequency of chatbot usage at websites in the area of cosmetics on web sites in Serbia. In section 4 a brief description of the new lecture on planning, creating and implementing chatbots for Information technology and Web design students in the Higher Technical Education School of Professional Studies in Novi Sad, is given.

## 2. CHATBOTS AND CHATBOT SERVICES

As already mentioned in the introduction, chatbots are programs which can be published on web sites. Their role is to communicate with users. Mostly, they present some kind of user support service. To be closer to customers, chatbots have a name, and introduce themselves at the start of the conversation. For example, Figure 1 shows the communication of *Joshua* - Sephora's chatbot (Contact customer service, 2019) with a customer, (Krunić et al., 2019). The customer asks for antiaging makeup. Joshua asks additional questions in order to precise the customer needs. This helps finding the final answer to the user.

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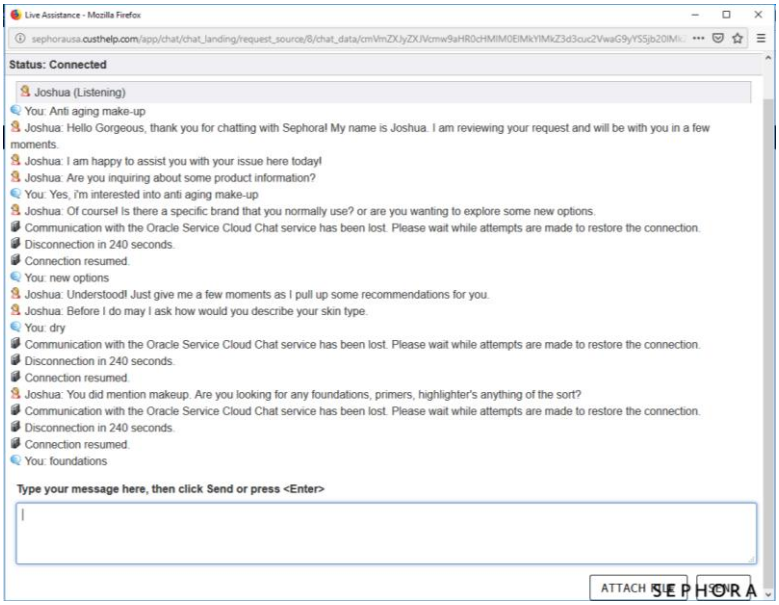


*Figure 1: Chatting with Joshua, Sephora's chatbot, (Krunić et al.), (Contact customer service, 2019)*

Chatbots are applications connected to databases, (Eupula, 2019). There are three main types of chatbots: Rule based chatbots, Intellectually independent chatbots and Artificial Intelligence (AI) powered chatbots, (Bots Crew, 2019). Rule based chatbots are very simple. They just offer a set of questions to the user, as well as predefined answers (mostly in the form of buttons, so the user can choose one among several given options). This works fine in many situations, but is inefficient in advanced cases with many conditions. Intellectually independent chatbots use machine learning in order to learn from data obtained by user interactions. In other words, the bot's knowledge consists on past information obtained from logs of discussions, and bots train themselves according to it, (Eupula, 2019), (Bots Crew, 2018). These logs are used to distinguish which question the user is trying to ask. AI-powered bots combine the two previous methods. They use Machine Learning, Artificial Intelligence and Natural Language Processing (NLP) for their conversations with users. Actually, NLP consist of two parts: Natural language processing (NLU) and Natural language generating (NLG). According to (Tutorialspoint, 2019), NLU consists of mapping natural language user input into useful representations and analyzing different language aspects, whereas NLG consists from obtaining appropriate content from the formed knowledge base and choosing appropriate words which form a meaningful sentence. Roughly speaking, NLP consists in dividing the text into words, analyzing the relationship among words in the sentence according to grammar, checking the meaningfulness of the text, analyzing the dependence of the sentence with the previous sentence, comparison of the sentence to real world knowledge, (Tutorialspoint, 2019).

Even though it looks complicated to create a chatbot, there are fortunately many online chatbot services which enable an easy creation of a chatbot and generate code which can be implemented directly on a web site. Some of them are free for use, like *Rebot.me* or *Snatchbot*. Such services rely on defining possible questions (or keywords appearing in questions) and appropriate answers, and are quite easy to use. For instance, Snatchbot has the ability to find synonyms of keywords automatically, Figure 2.

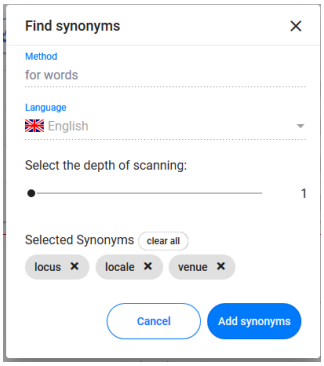


*Figure 2: Finding synonyms for the keyword „Venue“*

Figure 3 shows configuring and testing a conference chatbot. After creating a chatbot, the chatbot service provides an appropriate embed code which can be copied and pasted into the HTML page, Figure 4.

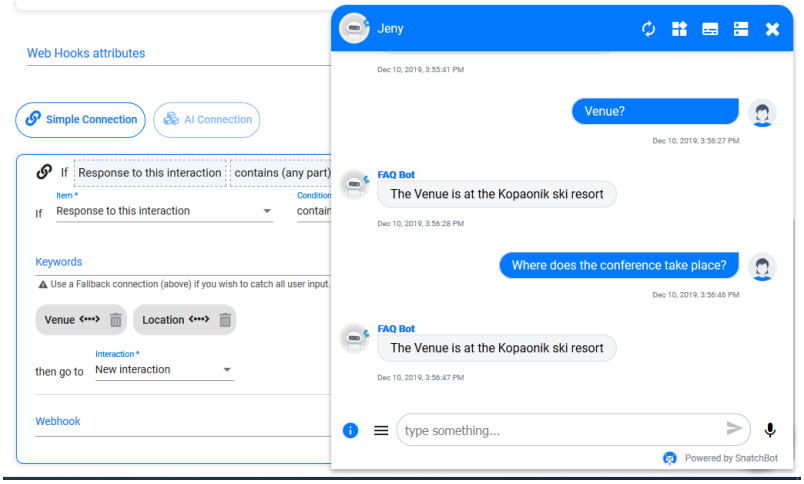


*Figure 3: Configuring and testing a chatbot in Snatchbot*

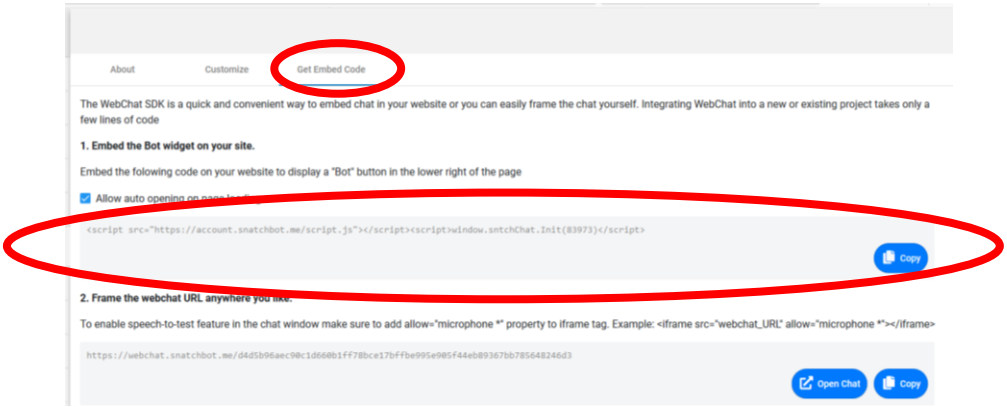


*Figure 4 – Getting the embed code for the Chatbot*

As one can conclude, using online services for creating a chatbot is not much complicated. But before starting the creation of a chatbot, one should invest time and effort in order to make an effective decision tree for the chatbot. A decision tree is actually a map which helps finding the right answer to customers' questions. Of course, the chatbot's initial question presents the root of the tree, (Lobo, 2019). For example, let us imagine a conference chatbot named *KmiBot*. The bot can start the

conversation with: „What information do you need? Do you want to submit a paper, become a reviewer, or do you have accommodation problems?“. If the user answers „apply for a reviewer“, the *KmiBot* moves the user one step further, and asks the user for his/her research area. Depending on the answer, *KmiBot* offers the user the sign up link, or explains that the chosen research area isn't a conference topic. Such a decision tree should be drawn in order to be analyzed for efficiency . Figure 5 shows the above described decision tree created in Lucidchart tool, (Lucidchart, 2019). Of course, real world chatbots have more complicated decision trees.

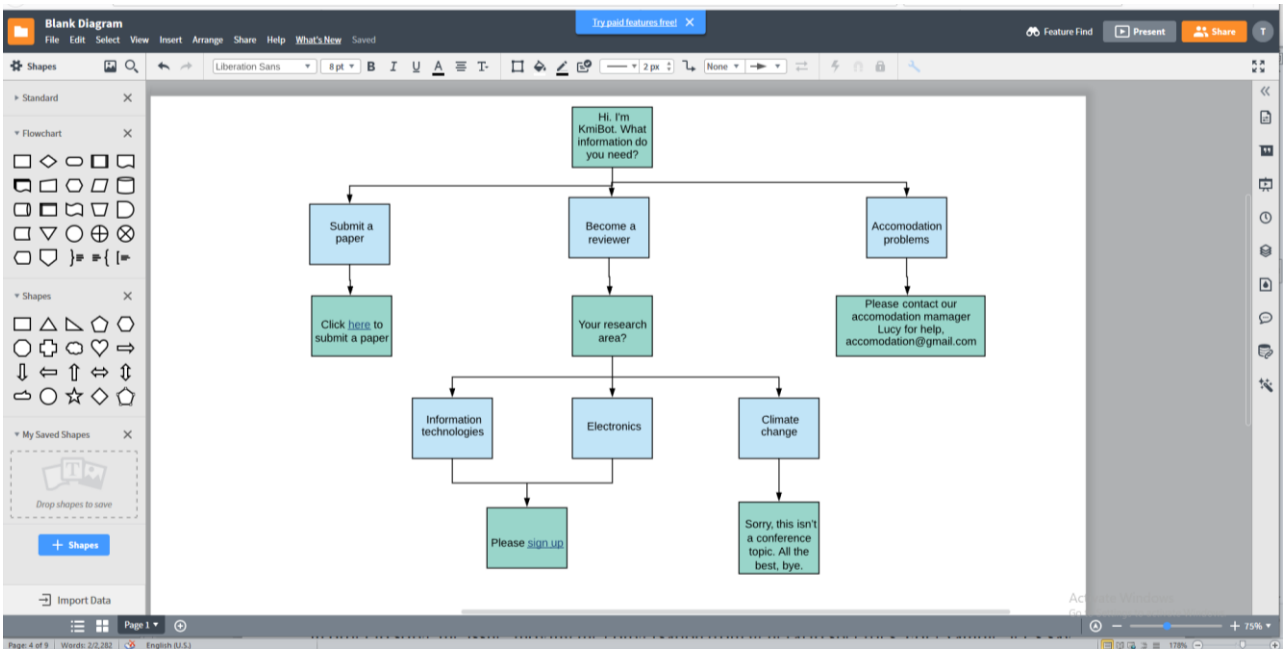


*Figure 5 – Creating a decision tree using Lucidchart tool*

In contrary, an ad hoc created chatbot can be a complete failure. It can fail to ask important questions which are needed to move down the decision tree in order to obtain the final solution for the user's problem. Also, it can fail to recognize several synonyms of keywords arising in the user's question, etc., (Steele,2018). Hence the need of investing time for preparing a detailed chatbot decision tree.

## 3. THE CHATBOT USAGE FREQUENCY SURVEY

In order to find to what extend chatbots are present on websites in Serbia, a small survey is conducted. The topic of websites for this survey is chosen to be „cosmetics“. People commonly have many questions before buying a cosmetic product or using a cosmetic service. So, it would be very useful to publish a chatbot on a web site in this area. The sample size for this survery is taken to be 98. This data is obtained on the following way. The Google search results page for the keyword „kozmetika“ (Serbian word for cosmetics) gives 37.300.000 results, Figure 6. This number is taken to be the population size. But obviously, this number is smaller. First of all, people in few other countries in the region use the same word as „kozmetika“ for cosmetics, so the number of Serbian web sites devoted to cosmetics is smaller. Besides, not all web sites on this topic listed in the search results are commercial websites. Some of them are blogs. Nevertheless, the number 37.300.000 is taken to be the population size.

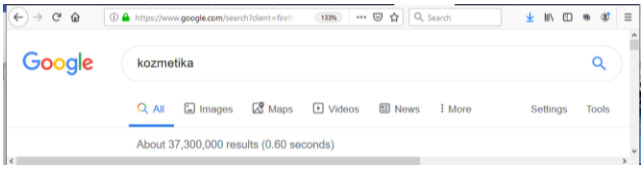


*Figure 6 – Google search results for the keyword „kozmetika“*

Using an online sample size calculator (Sample size calculator, 2019), with the confidence level 95%, and the margin level 10%, the sample size is obtained to be 97, Figure 7. Thus the sample size for this survey is taken to be 98. Figure 8 shows a part of the Excel file with data from the survey.

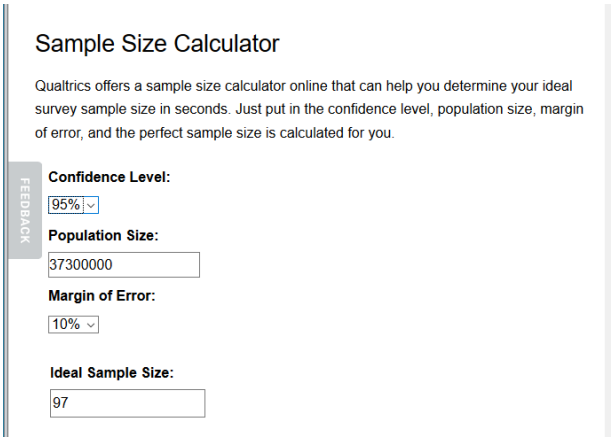


*Figure 7 – Determining the sample size, (Sample size calculator, 2019)*

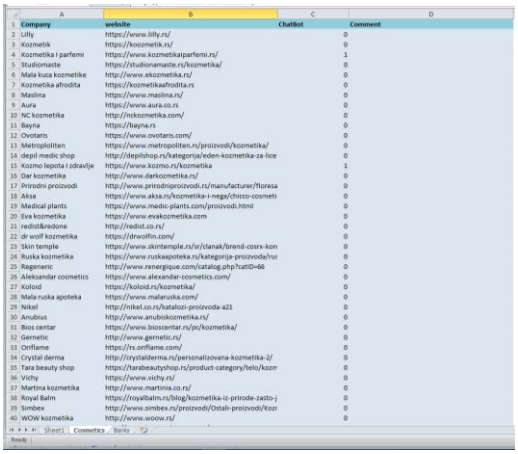

*Figure 8 – Excel file with data from the survey.*

The results have shown that chatbots a rarely used at cosmetic commercial websites in Serbia. Namely, only 4 of 98 websites have published chatbots, Figure 9. This is only 4%. Moreover, two of them have limited chatting periods. One of them is available for chatting from 8-20 h, and the other only from 9-15 h on working days, Figure 10.

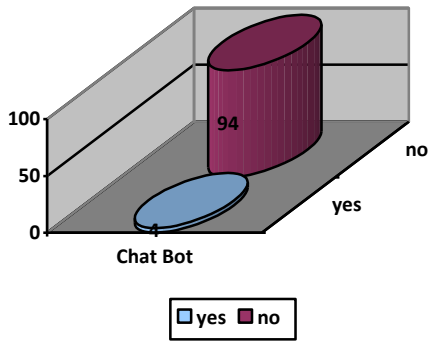


*Figure 9 – The frequency of using chatbots on cosmetics commercial web sites in Serbia*

Figure 11 shows a very efficient chatbot. In the shown example, the customer asks for preparations of the treatment of hair loss. The bot answers that the company sells only serums for hair loss treatment. The customer asks for the price, and gets the answer in a few seconds. A link for the product's advertising page follows.


*Figure 10: A chatbot with limited chatting periods*

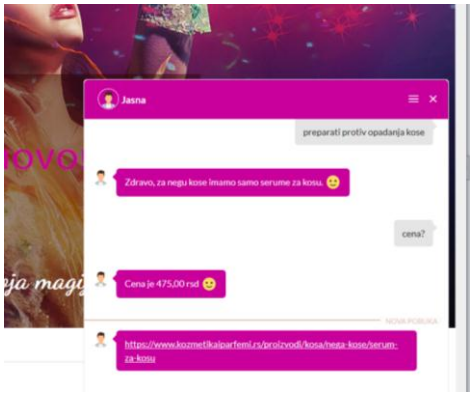


*Figure 11: A very efficient chatbot found in the survey*

## 4. THE NEW LECTURE ON PLANING, CREATING AND IMPLEMENTING CHATBOTS ON WEBSITES

Starting from the January 2019, Information technology and Web design students at the Higher Technical School of Professional Studies have a new lecture on planning (drawing decision trees), creating and publishing chetbots on web sites. This lecture is a part of the subject *Practicum* where students are included in various projects. As an outcome of the lecture on chatbots, every student has to create a website and a decision tree for an appropriate chatbot. After completing the decision tree, students use a free chatbot service (Rebot.me or Snatchbot) and create and publish the chatbot according to the decision tree. Figure 12 shows a student work: a chatbot decision tree. A website with a chatbot is created according to the decision tree, Figure 13.

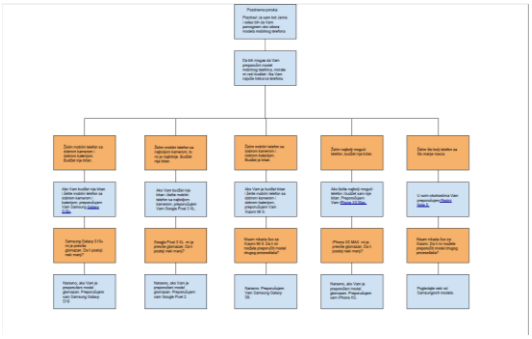

*Figure 12 – Student work: Chatbot plan*

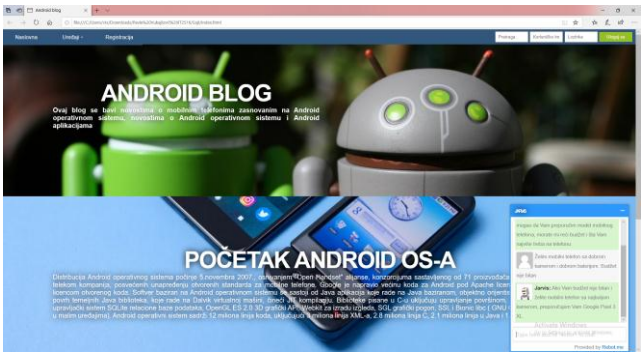


*Figure 13 - Student work: Web site with chatbot*

## 5. CONCLUSIONS

The use of chatbots on websites is the future of web development. Therefore, young web developers should be introduced with their creation and usage. As one can conclude from the survey conducted in this paper, chatbots are still rarely used on commercial web sites in Serbia. In order to make a small step to change this, a new lecture on chatbots for Information technology and Web design students at the Higher Technical Education School of Professional Studies in Novi Sad is included at the subject *Practicum*, starting from the season 2018/19. The lecture includes topics on planning, creating and implementing chatbots on web sites. Students participate on practical projects in this area. Students have shown a great interest in participating on those projects.

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