

Bachelor Thesis Review

Faculty of Mathematics and Physics, Charles University

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Thesis title A chatbot for the banking domain
Year submitted 2019
Study program Computer Science
Study branch IOI

Review author Mgr. Rudolf Rosa, Ph.D. Reviewer
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Overall

good OK poor insufficient

Assignment difficulty	X			
Assignment fulfilled			X	
Total size <i>... text and code, overall workload</i>		X		

The task of the thesis was to implement a banking chatbot for and in cooperation with a company. The difficulty of the original assignment increased considerably during the work on the thesis since the company withdraw interest and support for the work due to a loss of a customer. The assignment was not changed, but the author received only some support from the company, e.g. not receiving any sample dialogues, which had been originally promised and which would clearly help to guide the development. Also, some components of the chatbot had originally been planned to be developed by the company and provided for the final solution, which did not happen, and thus the author had to develop a significantly larger part of the chatbot than originally planned.

My understanding is that mainly because of this, the submitted solution is rather a proof of concept than an actually useful tool. The chatbot can handle a limited range of types of requests, but has many gaps which the user encounters very frequently. It has a module for frequently asked questions, but the evaluation showed that the users practically never ask these questions, i.e. this module is mostly not used. It has an investment questions module, which is active most of the time and tries to provide the user with information about investment products drawn from a knowledge base, in case that the user asks about a product or a property of a product that the chatbot has in its knowledge base; however, the knowledge base is quite limited; also, it seems that many knowledge is hard to get, as during a demonstration even the author had problems coming up with a user query that would trigger returning specific information from the knowledge base that the author knew was there. Then there is an individualized advice module, which is in my opinion oversimplified; it asks the user a few brief questions and then quickly recommends a very specific investment strategy, while for proper investment advice, one should know much more about the user, and also guide the user into the questions and explain what the questions really mean. The chatbot also has only a very limited stateful component, which means that rather than a continuous dialogue, the conversation is a set of independent request-reply pairs. The language generation component is also quite limited, mostly giving fixed answers and only occasionally dynamicall filling some slots in a template. The whole experience is thus more like searching through a FAQ section of an investment advice webpage, rather than a conversation. Therefore, I take the submitted solution as a good proof of concept, showing that using this approach, one could eventually build a useful chatbot, but it seems that this would take more effort, probably worth a Master thesis rather than a Bachelor thesis.

On the other hand, I very much appreciate a detailed error analysis, based on a user testing of the chatbot, in which the author identifies and admits many kinds of frequently occurring issues, explains their causes, and tries to suggest measures that would have to be taken to handle these situations better.

Thesis Text

good OK poor insufficient

Form	<i>... language, typography, references</i>		X		
Structure	<i>... context, goals, analysis, design, evaluation, level of detail</i>		X		
Problem analysis			X		
Developer documentation			X		
User Documentation				X	

The text is concise but clear and easy to follow, providing a high-level description of the whole system. For the low-level view, JavaDoc and KDoc code documentation are enclosed with the source codes. The problem is clearly stated, and the approach used is motivated, explained, and critically evaluated.

There is no user documentation per se. However, this is not a severe problem with a chatbot consisting of a single window with a single free-form text input field and a single text output field. Nevertheless, it turned out that some instructions have to be given to users (such as to use diacritics as the chatbot does not handle words without diacritics), and it would also clearly be beneficial for the users to have an overview of the capabilities of the chatbot, so that they can utilize the (limited) functionality it has, and not run into areas of conversation which it is incapable to handle.

There are some occasional mistakes in English as well as in formatting, but these do not hinder understanding the text.

What I was missing in the text is a longer sample user-chatbot interaction, showing how a whole conversation can develop; the author usually only provides one or two pairs of user and chatbot utterances.

Thesis Code

good OK poor insufficient

Design	<i>... architecture, algorithms, data structures, used technologies</i>		X		
Implementation	<i>... naming conventions, formatting, comments, testing</i>		X		
Stability			X		

The software bears clear marks of being done in and for a business environment, such as relying on tools and resources which are property of the company and therefore are not part of the submitted software, which naturally severely limits the usability and independence of the solution. The structure and conventions of the code are also partially imposed by the company's codebase into which the solution must fit, making it somewhat cumbersome and harder to understand. Although all of this is unpleasant, I believe it is understandable and tolerable in this situation, as it was already clearly stated in the assignment that the work will be done in cooperation with the company, also serving as a provider of some of the resources. On the other hand, the author clearly separates her own work from code and resources provided by the company, which I appreciate, as this is important for a proper evaluation of the author's contribution.

The implementations itself is stable. The chatbot often runs into situations in which it is unable to properly reply to the user's request, but due to a recovery system usually provides a reasonable reply, such as answering part of the request, or explaining that it is unable to answer the request. In some cases, the response contains some debugging information, which obviously would not be acceptable in a deployed tool, but I assume this would be easy to hide, and at this stage it is interesting to see how the chatbot understood the request (even if it is not able to reply).

Overall grade Very Good
Award level thesis No

Date

Signature