

## SHORT TERM SCIENTIFIC MISSION (STSM) – SCIENTIFIC REPORT

The STSM applicant submits this report for approval to the STSM coordinator

**Action number: CA16105**

**STSM title: The Effect of Conversational User Interfaces on Learners' Progress: The Role of Chatbots in Language Learning Applications**

**STSM start and end date: 28/07/2018 to 11/08/2018**

**Grantee name: Branislav Bedi**

### PURPOSE OF THE STSM

The purpose of the STSM was to investigate possibilities of including chatbots into user interfaces for language learning. Such interfaces belong to the category of Conversational User Interfaces (CUIs) because they help learners to enhance their conversational practice in the target language. The aim of this STSM was to visit the hosting institution INESC-ID and discuss the above topic with the host and other researchers, who already have experience with developing chatbots and including them into applications. Another aim of this STSM was to connect with colleagues of an MC member country of EnetCollec and expand the network of crowdsourcing and language learning while sharing mutual knowledge in this field. It would help enlarge the network of this cost actions and create a basis for a possible future collaboration in a development of a language learning application that would include conversational chatbots.

Chatbots are computer programs that have the capability to conduct a conversation via auditory or textual method. They belong to the category of conversational agents are part of multimodal dialogue systems because they support different types of input and output, i.e. spoken and written. Their purpose is not only to entertain and assist with problem solving, but also to interact with users and create a pleasant experience of their use of the application or program. The purpose of this STSM was to look into the historical developments of chatbots and discuss their usefulness within language learning applications.

### DESCRIPTION OF WORK CARRIED OUT DURING THE STSM

During the STSM 28 July -11 August 2018 (14 days), the following work was carried out:

- Reviewing the historical development of chatbots for language learning applications and discussing this topic with particular researchers at INESC-ID, who had already written an article about it (unpublished);
- Gathering literature overview on the historical development of chatbots and what effect they have in conversational user interfaces;
- Discussing with colleagues at INESC-ID the role of chatbots and NLP (Natural Language Processing);
- Independent brainstorming sessions addressing the merge of NLP and chatbots in language learning applications;

- Writing an annotated summary of literature overview on the above topics;
- Compiling an extended abstract for a possible research article.

During the stay, the work was carried out in meetings and independent study sessions. Relevant topics were discussed with Dr. Anabela Barreiro and some of her colleagues at INESC-ID. Based on this activity, new topics were developed that could positively influence the work carried out in WG3 of enetCollect, i.e. combining NLP with features in conversational interfaces. A contact to another researcher has been gained, Dr. Luisa Coheur, with whom we discussed the historical development of chatbots and their role in applications, as well as the work and projects that the researcher has carried out.

### **DESCRIPTION OF THE MAIN RESULTS OBTAINED**

A literature overview of selected works on chatbots for language learning applications was created. This helped to understand the purpose of including chatbots into interfaces of (not only) language learning applications, which will eventually serve as a point of reference for future work that will be planned together with the host, Dr. Anabela Barreiro.

In addition to the literature overview mentioned above, also a historical development of chatbots was discussed based on an article (yet unpublished) from Dr. Luisa Coheur and her colleagues. According to a discussion, this article would serve as a very suitable base for introducing chatbots as a practical feature into CUI of language learning applications. Dr. Luisa Coheuru and her colleague(s) have been invited to the joint WG3 & WG5 meeting in Leiden, which will take place on 24-25 October 2018. In there, the researcher and her colleagues will put this article into the context of language learning platforms and possibly adjust it so as fit the topic of a possible publication of proceedings from this meeting. This will be very beneficial to the enetCollect action because it will shed light on the importance of NLP and other learning methods while keeping learners entertained.

Based on the mutual interest of chatbots and NLP, this STSM contributed to the development of a topic on including chatbots as agents for teaching learners formal/informal language based on the learner's written input. If learners would put a text with a very formal language the chatbots would advise how to say certain phrases in an informal way, or vice versa. This topic had already been addressed by the host Dr. Anabela Barreiro in her article on this subject (unpublished), but we developed it so that it would a chatbot and NLP in a language learning application. Dr. Barreiro's research sheds light on the necessity to include such feature into language learning in order for the learners to grasp both formal and informal way of communication.

### **FUTURE COLLABORATIONS (if applicable)**

Together with the above mentioned researchers from INESC-ID, the future collaboration includes:

- A) Developing the topic of NLP tools and including chatbots to LL applications in order to teach formal/informal language based on the learner's text input, which can include either formal or informal text in the target language. We are planning to collaborate on this topic so as to look for partners for developing a prototype featuring this.
- B) Continuing collaboration with colleagues from the host institution on the historical development of chatbots in language learning applications and including their article into the proceedings of the planned joined WG3 & WG5 meeting.

I received the above report and I approve it.

Best regards,

Dr. Anabela Barreiro

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