"J’arrête de fumer"

Going beyond the relapse peak on social network smoking cessation programmes: ChatBot opportunities

Fabien Dubossor\textsuperscript{a}, Roger Schaer\textsuperscript{a}, Roland Savioz\textsuperscript{b}, Michael Schumacher\textsuperscript{a}

\textsuperscript{a} University of Applied Sciences Western Switzerland (HES-SO), Sierre, Switzerland
\textsuperscript{b} Sibrid, Digital Agency & Valais Health Promotion, Switzerland

Abstract

Research question: A social network programme called “J’arrête de fumer” was set up in 2016 in the six French-speaking cantons of Switzerland. It consists of Facebook groups where people agree on a date to quit smoking. A peak of relapse appears during the first three weeks of the programme. This research aims to explore the feasibility of building a ChatBot to help people to get over this peak in future iterations of the programme.

Methods: It has been shown that the urge to smoke may be one of the reasons for relapses. Being able to distract users from the idea of smoking during these phases would help them to get through these three first weeks. Due to the large number of participants, a human intervention within the craving time frame is difficult to achieve, but such a constraint would be easier to overcome with ChatBots.

Results: A ChatBot for the Telegram platform has been developed. It offers five different modules to cover the time frame where the urge to smoke is greatest. Some of these modules, such as motivating comments and factual information, are already well used, but some others are less widely explored, like helping scientific research by classifying images or putting people in touch with each other as another form of distraction.

Conclusion: ChatBots offer interesting opportunities for helping smoking cessation communities, as they would help participants during craving time frames and would be able to handle the large number of participants.

Key words: ChatBot; smoking; cessation; Social Network

Introduction

The programme J’arrête de fumer was set up initially by the Cipret Valais\textsuperscript{1}. It consists of a Facebook group that people can join to quit smoking together on a fixed day. Such a concept allows them to share their experiences and to support each other in their objective. A first pilot phase ran from September 2015 to March 2016, which was then extended in 2016 to the six French-speaking cantons of Switzerland [1]. This kind of social network approach allows more participants to be reached than in traditional cessation programmes. The “J’arrête de fumer” programme of 2016 gathered more than 7000 participants over the six cantons. A study on the topic of social network cessation programmes was published recently [2] and supports the benefits of such approach for smoking reduction and cessation.

The administrators of the “J’arrête de fumer” programme have noticed a peak of relapse during the three first weeks of cessation as shown in Figure 1. Many parameters may have an influence on this fact, such as physiological addiction to nicotine or the loss of the social aspect of smoking. These problems are already known [3–5] and are usually addressed by traditional cessation programmes. It has been specifically noticed though that the urge to smoke is one of the causes of relapse [6, 7], and it can be addressed in this programme. Helping participants to overcome these urge phases in some way would help to reduce the relapse ratio, which would have a significant impact even with only a slight improvement due to the large number of participants. The “J’arrête du fumer” 2016 team was composed of 22 people working 7/7 days from 6 am to 23 pm. They had to deal with more than 13 400 messages during the first week of the programme. Such a large number of messages is almost impossible to manage within the team, even though it consisted of 3 medical doctors, 11 specialists in smoking cessation and 8 community managers. This is problematic because some participants may need direct support, especially for craving phases. Using ChatBot technologies may improve efficiency for addressing such issues.

The concept of the ChatBot has gained increasing attention in the last few years [8]. By definition, they are algorithms that are able to converse with people by understanding natural language, and most of them appear as traditional contacts in messaging applications. In practice, most ChatBots are algorithms that work in messaging applications, and respond to natural language, keywords, buttons, audio or even images. ChatBots also offer some advantages compared to standard mobile applications:
There is no need for participants to install another specialized application;
Multi-platform support out of the box for Android, iPhone, Windows Mobile, Linux, Windows and Mac OS, because messaging applications already host clients for most of the operating systems;
Login, password reset, authentication or even scalability are taken care of by the messaging application so it does not have to be managed by the ChatBot.

In this work, we explore opportunities for using ChatBots to help users overcome the relapse peak in social network cessation programmes. We present a prototype implementation in Telegram – a messaging application – and finally discuss issues and future possibilities for ChatBots.

Methods
To help the participants to overcome the urge to smoke, a distraction interesting enough should be presented so they focus on this instead of thinking about smoking cigarettes. We explored several ways of distracting users. We limited the number to five techniques, and we selected only techniques that could be implemented through ChatBots:

Motivating comments
The idea of this module is to provide the participants with motivating comments from other users, which has the effect of presenting a distraction as well as motivating them to hold on to their goal. A large quantity of positive comments was left in the Facebook group during the first programme. These can be reused, anonymously, to motivate the next group of participants. For instance, comments like this: «Since I stopped smoking, my children hug me a lot more because now I am a mommy that smells nice.»

Multimedia content
Audio, video and articles can be used to distract users. There are millions of videos available on streaming platforms such as YouTube. Redirecting participants to watch a funny video, a musical clip or to read an article would be an option.

Games
Some messaging platforms such as Telegram allow users to develop games within discussions. This opens up the benefits of all the gamification theories, and in turn help to maximize users’ engagement and distract them from smoking. Participants may want to duel with their friends in the programme, or to appear in the leaderboard of a game.

Putting people in touch
One import aspect of social network cessation programmes is the notion of community, as presented in the final report of the programme [1]. People can help each other to hold on to their aims by engaging in discussion. Putting people in touch in a useful way requires careful preparation to ensure anonymity and to prevent excessive notifications.

Helping to classify medical images
Some people seek tasks that make them feel useful, hence the idea of being useful to society by classifying medical research pictures. This is a win-win solution, as smokers are looking for a way of being distracted, and researchers are needing annotations of medical images.

Different people have different preferred distractions. For instance, a woman in her thirties may be more sensitive to distraction regarding motherhood and children than a man in his twenties. Profiling the participants will help with customization of the distractions provided to maximize the success. To build profiles, some relevant data such as gender, age, areas of interest or location could be asked through the ChatBot directly. We do not have such data yet, but these can be acquired during the next programme, or derived through a study with focus groups. The data can then be analysed to extract clusters and information about preferences in order to improve help to future participants. Personal preferences should also be asked individually of participants, as some people may not fit with the profile they belong to.

Interactions with ChatBots can take several forms. First, contact can be made through natural language: this offers a lot of room for the participant to formulate responses, but interpretation of the meaning by an algorithm is complicated and error-prone. Second, keyword-based interactions have more restrained inputs, but the algorithms are simpler and more deterministic as they know exactly how to interpret responses. These two interactions are text-based modalities, meaning they require the participants to write responses on the keyboard of their phone, and only the text is interpreted. The drawback of such a text-based modality is the tiresome process of writing text messages.

With advances in messaging applications, it is also possible to send other kind of content to contacts, including ChatBots, as for instance emojis, pictures and sounds. These modalities may be interesting in some situations, like for instance if a participant wanted to ask a question about a growth in their mouth. But these modalities used alone do not constitute a complete means of interaction. Finally, some platforms such as Facebook Messenger or Telegram allow interactive menus through buttons. This permits quicker interaction than text but is limited to keywords answers. We chose this last method for making the prototype, in the knowledge that it is still possible to combine it with other modalities in the future if needed.
Prototype

A prototype of ChatBot helping people to quit smoking by distracting their focus from cigarettes has been built on the Telegram platform. Telegram is a messaging application like WhatsApp or Facebook Messenger. Telegram was chosen because the platform is open, and because it supports all previously cited modalities of communication. The ChatBot appears as a normal contact in Telegram, and people can see a description and can decide to start using it by pressing a “start” button (this is the standard for bots in Telegram), as shown on the left in Figure 2. Once they start the conversation, the bot asks for some information to build their profiles, such as gender and age. Participants can answer these questions with custom keyboards (as shown in the centre of Figure 2) or with text directly. Finally, the main interaction with the bot is done through an interactive menu as shown to the right of Figure 2.

Different modules to distract participants that were proposed in the previous section have been implement in the prototype. They are accessible through the main menu:

- “Sections” opens a submenu that gives access to Facebook groups in each canton.
- “Motivateurs” show motivating comments from other members of the community that would be gathered from previous programmes.
- “Contenus” opens a submenu to select a subcategory of music, videos or articles, and then sends a link to random content of the given type. An example is shown in the centre of Figure 3.
- “Jeux” opens a simple game that we developed in the context of this prototype: a button that should be clicked as much as possible in 30 seconds.
- “Aide” sends request for help to all other people from the same canton registered in the ChatBot. Other users receive a notification with a message as shown to the right of Figure 3. They can either reply “yes” or “no” to help. Once someone has offered to help, the “Oui/Non” button disappears from the chats of other participants and the applicant receives the Telegram username (no phone number included) of the person offering their help. The selection could be fine-tuned with participants’ profiles in the future.
- “Recherche” is the starting point for classification tasks. The ChatBot sends images to the user asking for annotations by pressing buttons. The “Stop” button ends image processing. This is shown to the left of Figure 3.

Discussion

The prototype was deployed on Telegram a few months ago and is still running. This allowed us to show the idea to the administrators of the “J’arrête de fumer” programme, who in turn have been able to test it (as the ChatBot is public). Using ChatBots in the context of smoking cessation programmes is interesting as it is easy to set up an application without having to deal directly with the burden of creating a multi-platform application, handling registration and authentication securely, taking scalability into consideration or having to manage uptime. The development of modules has also shown speedup comparable to traditional applications: video and audio content are handled natively on all platforms and sending images for annotations does not place any demands on bandwidth. There are of course some drawbacks, the main one being limitation of the number of interactions. Everything passes through messages sent back and forth between the participants and the ChatBot. This limitation has not caused any issue for the functionalities developed in this work, but may be problematic for some future ones. Creating rooms for discussions between groups of people would not be possible easily through the chatbot for instance.

The five modules that have been developed support a large range of technologies: video, audio and images content, games, putting people in touch, and annotating pictures. This means that other advanced functionalities can be developed on the platform, which suggests that there will be further future possibilities.

The proof of concept needs further testing under real conditions, but the current status of the prototype suggests that deployment will be straightforward. The next step is to use the ChatBot in the upcoming “J’arrête de fumer” programme, which would allow us to start gathering participants’ profiles and statistics about their module use. The ChatBot may have to be ported to Facebook, but as there are already Facebook groups, this would not require much additional information from users. Finally, some feedback mechanism about when people are smoking would be needed in the future to measure the success rate of the different modules. This would be needed for the improvement of the ChatBot and its modules, and to improve the programme’s overall success.

Disclosure statement

No potential conflict of interest relevant to this article was reported.
It is possible to try it live by installing Telegram and then searching for “JDF_CH_bot”. The bot should be running at least until the December 2017.

References


Correspondence:
Fabien Dubosson
University of Applied Sciences Western Switzerland (HES-SO)
Technopole 3
CH-3960 Sierre
fabien.dubosson[at]gmail.com
### Figures (large format)

**Figure 1:** Success ratio over weeks (J’arrête de fumer 2016).

**Figure 2:** Some screenshots of the ChatBot in action.
Figure 3: Example of modules.