**Stop Together**

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**Abstract**

We have focused on developing an application that aids smoking cessation in the most effective way possible, so that users can quit smoking in a fun environment that encourages people to share their motivation with each other.

We found that users want a group support system, where they can have multiple people to talk to when they’re craving cigarettes, and they want to be able to watch their progress over time, seeing how much money they have saved by not buying cigarettes, and the amount of their lifetime they have gotten back by not smoking.

**Introduction**

The tobacco epidemic is one of the biggest health threats we’re currently facing in our world. At least six million people die a year from tobacco use as of now, and in a worst case scenario by 2030 the yearly deaths from tobacco could exceed 8 million. According to the Center of Disease Control 70% of US smokers are eager to quit smoking, and 40% of these smokers make an attempt to quit each year. Only 4-7% of the people who try to quit without external help are successful, proving that people who smoke want to quit, but are not able.

We seek to provide an effective method for smoking cessation, using researched methods that are proven to help people quit smoking. We drew from previous research on the subject as well as conducting interviews to see what sort of functionality would best help people quit smoking, and used that research to make a mobile application.

We used our research and interviews to make the most effective application that we could, integrating proven smoking cessation methods with the ideas given to us in our interviews by people who have tried to quit smoking before.

**Related Work**

When we started out we didn’t have any competent applications to look at for reference. Most of the applications in the android app store don’t follow any practice guidelines, and are likely made by well-intentioned programmers who don’t have the knowledge of the subject to create an effective application. Some of the applications in the store are even pro-smoking.

In our research we found the characteristics of a successful smoking cessation application. We used these to as the foundation for our application. We focused on ease of use, access to support materials, access to support groups, a fun environment, and access to role models. We worked to make sure that all of these were fulfilled in our final prototype.

When conducted our interviews we found that some of our preconceptions were wrong, and the small daily struggles in quitting smoking inspired several ideas we applied to our application. We combined these small struggles with the foundation our research gave us.

In our research we also found that there are 96 mobile phone subscriptions per 100 people, meaning that right now the best way to reach people is through their mobile phones.

**Need Assessment**

We conducted four one-on-one semi structured interviews. We interviewed three women, and one man, all either former smokers or current smokers. Two people said they tried to quit four or five times, while another said they had tried to quit “multiple times”, and the final interviewee had tried to quit twice and succeeded.

We asked them qualitative questions, listening to their answers and trying to discover as much as possible about the struggles of quitting smoking.

**Findings**

Buddy System

All of the interviewees agreed that a buddy system would be helpful in quitting smoking. People thought it would be good to work with a group as opposed to an individual, one interviewee said that this would be beneficial in case of an imbalance of enthusiasm between participants. If one person never used the application and you were a member of a group, then there would be other people there to support you while you were having a craving.

Many of our interviewees also said that they would like to have the option to be in groups with people they already know, so that they have personal accountability as well as support from their friends. They said this would also help them, as there can be real life temptations when your best friend or roommate smokes.

Known Smoking Cessation Application

We were surprised when we collaborated the results of our interviews and discovered that not one of the people we interviewed had heard of a smoking cessation application before being interviewed for this project. Furthermore, all of them agreed that they would be willing to pay for an application that was proven to help smoking cessation, citing the amount of money they spend on cigarettes already.

Reward Systems

We were surprised when one interviewee admitted to using cigarettes as a reward for themselves after abstaining for a period of time. After having this one cigarette, or possibly more than just the one, they fall back into the habit of smoking.

Another type of reward system was spoken of during the interview process, several the interviewees showed great enthusiasm for the fun side of a smoking cessation application, in the form of achievements and progress badges. One interviewee said that they often were on their mobile phone playing games while smoking, so using that kind of structure for an application could lure in some people who might want a more fun environment.

**Paper Prototype**

Our paper prototype consisted of four primary features. The first feature was an account creation and information gathering module. It consisted of 4 screens with questions regarding your current smoking habits, followed by your goals and motivations, followed by demographic information. This feature was important because each user needs to have an account, and also because this data allowed us to calculate statistics on the users smoking behavior and provide them and their friends with feedback on their smoking usage and their success with quitting. This kind of data was the basis of our buddy system approach, an approach we adopted through careful research on existing smoking intervention apps. The second feature was the dashboard, which was essentially a home screen, for the user to gauge their performance on fields such as number of days smoke free, cigarettes not smoked, money saved, and life saved.

The dashboard also contained a “friends” feed which would update the user on the performance of the friends. We found through our interviews that being able to watch your friends struggle and succeed was an encouraging factor in ones own ability to maintain smoking sobriety. The third and fourth modules were in support of the dashboard. The friends module consisted of a list of the users current cessation buddies which you could click on and see their daily/overall statistics. And the statistics module Showed provided the user with graphical and text based data on their own performance over time. We chose this feature because several of our interviewees made mention of being able to track their own data over time to see their improvement and how this could act as a reminder of all the progress they’ve made. We also found that many successful applications leveraged the use of data and statistics to illustrate the performance of the user.

**Final Prototype**

Our Final working prototype consisted of the same 4 primary features as our working prototype with some minor and major alterations in each case. Our account login and creation module consist of 4 information gathering screens where we still collect data on habits, goals and demographics. This feature was essential in gathering information about each user so we could provide an individual experience. Our Dashboard and friends modules remain the same, though the goal for our statistics page is to allow the user to compare their performance with that of their friends. We had planned on implementing back to back infographics of the users and their friends with graphs, charts, and textual data; however this feature requires more time and data to implement effectively. We did not update much from our paper prototype because we felt that our features were well researched and the user data gathered from our interviews led us to believe that, these would be successful features. Without a longer evaluation past we felt it to be more reasonable to listen to the feedback our our initial user base and application research. Our application was built on the android platform in android studio. Android applications are written in Java with xml for front end designs. Our client code features a sqlite database which stores all of the data on the user and the user’s friends. This local database interacts with the front end to store and produce the relevant data for calculating statistics and so on. The client code used http protocol to communicate over the web to a remote server which acted as the central hub for all our users to connect with one another. This web server was built in python with the bottle.py framework to handle http requests, interact with the central SQL database and issue responses to the various users. We tested and developed primarily on Nexus 7 tablets and so our designs are optimized for those devices. The design pattern we tried to follow was a model view controller pattern which modularizes the views, the business logic of the application, and the data.

**Discussion and Implication**

We used the feedback from our interviews and structured our application as a group-based cessation smoking application rather than our original idea which was more focused on two-person groups. Having multiple people in a group increases the chances of positive role models within that group. If one person is having a lot of success they can encourage their group members and in turn get encouragement for continued abstinence. This way people might also be less likely to slip back into the habit of rewarding oneself with a cigarette after having abstained for a long time.

Research says that to be successful, a smoking application should be easy to use, so in designing our application we made sure that it was simple to understand, with ease in fetching the statistical information that research shows also encourages people to quit smoking, such as money and life saved. Seeing these numbers on a bad day is sure to encourage someone going through a craving, or questioning their decision to pick up their first cigarette in a while.

Because of the emphasis on rewards we incorporated more static information in our application than we originally planned on. Because of the enthusiasm for milestones and achievements users can watch themselves save money, and even years off their life. Not only is this information a powerful reminder of why the user is trying to quit smoking, but it can be fun to look at, and stretch for a few more days without a cigarette in order to get the next achievement.

The emphasis on data and rewards serves as a way to make the application more fun for the user, a necessity to keep them from becoming bored with the application and giving up on it. The social environment of being able to watch your friends’ progress as well as your own, and share stories, advice, and encouragement all combine to make a fun environment for people to quit smoking together.

Our findings should be interested in those who want to quit smoking, or are interested in stopping the smoking epidemic. Our application could be used by people who want to quit smoking, and if it works, has the potential for success in the marketplace as well as success in improving the health of users.

**Conclusion**

Overall, we discovered that people would be very interested in an application that aids smoking cessation. Smoking is an epidemic that has the potential to become a lot worse, and although many people want to quit, most find the process difficult and tedious, often taking years and many failed attempts to quit before being successful.

Our research was limited by time and resources. As students with other commitments, we didn’t have the time that professional developers might have to gather data and develop an application. We also would have liked to do more in-depth interviews, and spoken to our interviewees again after developing the prototype to get their advice and opinions, as well as new user’s ideas to continue expanding the project.

If we had more time we would expand our application to have more focus on a reward system, with milestone markers, perhaps achievement badges, just like our interviewees got excited about.

We could also try and increase the good our application is doing by having people put down money on how long they can keep from smoking, and if they fail, have the money be donated to a smoking-related charity, or a charity of their choice, to give users the option of a monetary incentive as well as social incentives.

**Sources:**

“Why do mobile phone-based smoking cessation interventions struggle and how can we make

them more effective?” by Ahmed, Shameem; Sharmin, Moushumi

http://www.who.int/mediacentre/factsheets/fs339/en/

http://www.cdc.gov/chronicdisease/resources/publications/aag/osh.htm

http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2013-e.pdf