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Using Personas in the Development of Smoking Cessation Mobile Application

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ABSTRACT

The use of mobile applications for healthcare is a new and vigorous area that could enhance the welfare of individuals across the globe. Health applications in technological devices (smartphones, PDAs) empower upsurge-frog-proportion convenience to enhance entry to health improvement and mediations. These health applications prove beneficial in a number of aspects, such as supplying therapeutic content through a digital device, mobile welfare applications, and the applications constructed to access digital health and private health evidence. Tobacco smoking can be injurious to health, creating a number of afflictions and damaging the health condition of smokers. Smoking cessation enhances life expectancy since it shortens the danger of expiring from certain smoking-associated afflictions for instance, lung cancer. In this study, our main aim is to propose a smoking cessation application using personas. Based on the interviews with the smokers, we developed two fictive characters, so called *personas*. From the resulting personas we derived a number of possible designs, where the smoking cessation application would assist the smokers in an efficient manner.

Key words: **personas, user requirement, smoking cessation application**

1. Introduction

According to the Global Observatory for eHealth of World Health Organization (WHO), mobile health is explained as the therapeutic health system backed personally by cell-phone devices, personal digital assistants (PDAs) and other communicating devices. Mobile health or m-health applications have become pervasive and billions of applications can be downloaded to smartphone devices, tablets used by different types of people throughout the world. These health applications can allow people to maintain their own health, encourage vigorous life-style and attain approach to embodied health related news or facts anywhere (Zhang & Polytechnic, 2014). These health related applications are not expensive in anyway and aim to enhance the health

management of individuals as well as transform the behavior to bolster inhibition which can enhance the health issues over a long period of time (World Bank, 2011). With the increased growth of these devices throughout the world, developers have developed a number of health related application for health afflictions (Ghorai, Akter, Khatun, & Ray, 2014). Cigarette or tobacco smoking is a kind of drug addiction and present day cigarettes are efficient enough for individual administration of the drug nicotine (Russell, Armstrong, & Patel, 1976). Once inhaled, the nicotine reaches to the smoker's brain swiftly than heroin infused into a vein of an individual. Nicotine reaches to an individual's brain within 7 seconds in comparison to the blood which takes 14 seconds to reach brain from an individual's arm. Young teenagers smoke for a number of psychological and social reasons. It feels refreshing to them rather than giving them an agitated feeling. But as people increase the amount of cigarette smoking they develop fortitude against the bitter effects hence, the smoker reaches to the level of addiction (MCKENNELL, A. C.; THOMAS, 1967). The statement 'Once a smoker always remains a smoker' has been over-stated. Four out of five smokers desire to quit smoking or else proceed with their smoking habit only because they become addicted or dependent on it. Essentially, the word 'dependence' or 'addiction' indicates the condition where the person's desire for something is so high that the particular person cannot get rid of the habit and in severe actions he or she cannot resist from it when it is present around them. Smoking cigarette or tobacco undoubtedly drops in this section and some other kinds of drug consumption are obsessive similar to nicotine acquired by cigarette smoking. Hence, cigarette or tobacco smoking is undoubtedly addictive (Russell et al., 1976) (MCKENNELL, A. C.; THOMAS, 1967). Among smokers, heavy smokers in contrast to the light smokers contemplate dependence entirely, relevant reports has been synthesized and the information is not sufficient. (Gritz ER, 1973) could discover no contrast in yearning among light and heavy smokers strapped of smoking for complete two days. Another study (Shiffman & Jarvik, 1976) could present similar results as (Gritz ER, 1973). (McMorrow, Martin J.; Foxx, 1983) presented data indicating that heavy smokers managed nicotine level and found that assimilation hardly by smokers does not appear linked to nicotine. Pre-abnegation plasma nicotine quantity has been found in detail to interact ineludible with appetite and other withdrawal conditions. Some researchers suggest that heavy smoker's tobacco intake is linked to subjective cueing growing from the inconsistency in nicotine quantity. In one study, smoking behavior was observed when interacting with other people and when being screened from general activity. Light smokers smoking level drops in social gatherings whereas heavy smoker's tobacco dependence does not differ in any condition (Miller, Hospital, Island, Frederksen, & Hosford, 1979). In another study, light smokers displayed sympathy towards conditional braids whereas heavy smokers modified inhalation in feedback to handling of tobacco nicotine level (Herman, 1974). Quitting smoking not only improves an individual's health situation but also behavior and composure. Coughing, tiredness, shortness of breath all are reduced. Within eight hours of quitting carbon monoxide level drop to normal. Along with this, chances of development of heart attack, lung cancer also drops down. In this study our main aim is to design

a smoking cessation mobile application to increase smoking cessation rate of smokers using personas. The resulting personas illustrate potential needs, expectations for the smoking cessation tool that would be effective and efficiently assist the smokers in quitting. In this study we elucidate the process we employed and the resulting personas as well as the design expectations for the smoking cessation mobile application.

2. Review of literature

2.1 User-Centered Design

UCD as an integrative activity, which combines personal aspects and functional design information and methods with the aim of increasing performance and capacity, enhancing individual cultivation and preventing the expected conflicting results of handing on individual health condition, security and efficiency (Voldan, 2011). The ISO 13407 standard (Standard, Principles, Design, Activities, & Factors, 1994) provides a detailed information highlighting about the handling of personal centered actions amid evolution flow, but does not indicate any particular technique. User-centered design can be divided into four main steps – analysis, design, implementation and launch of commodity. Relationship amongst highlighted steps are shown on Fig.1(Voldan, 2011)

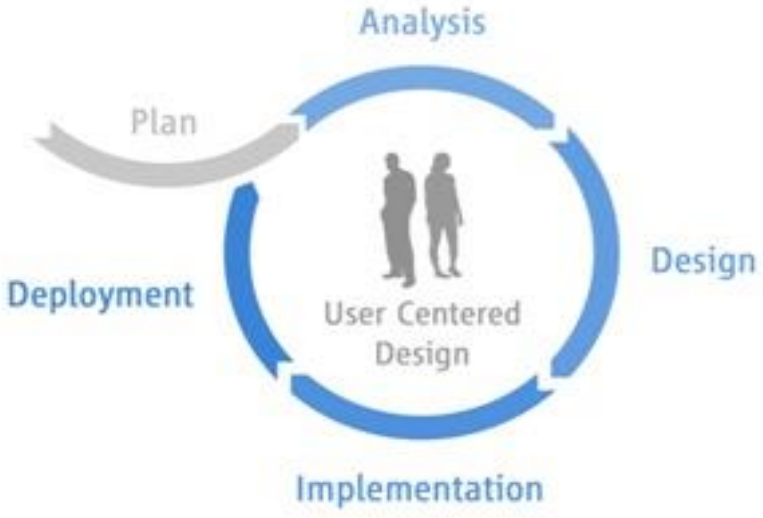

Fig.1. User-Centered Design phases

Usually, user-centered approaches concur sketch aim amongst customers and creators which are then produced and approved with customers until the objective is fulfilled. There is a huge variety of techniques to evaluate the requirements of the customer in the design of products and background. These involve field studies, iterative design, focus groups, user interviews and contextual and participatory design.

Pruitt and Adlin suggest that the application of imaginary personas may suggest an interesting and focused archetype of the user to which design groups can invoke to guarantee that their designs continues being user fixated. This tool also proposes a technique through which the requirements of users who do not involve in the participatory flow can be studied in the design system (Siddall, Byrne, & Byrne, 2011).

2.2 Personas

Personas have become one of the famous equipment since they were first brought in by Alan Cooper kind of source for including user data in the design flow. Mentioning thoroughly composed well-off narration of imitated beings, design team looks forward to employ 'real people' so as to verify whether the product is suitable for the purpose. Alike other methods such as cultural probes, personas are aimed to involve people with useful data about end-users. So that it can be mentioned during design mechanism. This is done in combination with other user centered techniques for example, user testing as personas are not accustomed to support the responses concerning product utility and operation (Cooper, n.d.). (J. Pruitt & Adlin, 2005) recorded the concept of intriguing briefly elaborated blue-print is recent and acknowledged radical by majority because the traditional mental attitude is to avoid the opinions of a single user so as to fulfil those of far-reaching audience. On the other hand, (Cooper, n.d.)asserts that conflicts typical rationale, it is good to design with one individual mentally instead of including many individuals, pretending the individual user being mentioned to is built appropriately and is observed as a genuine portrayal.

The use of personas in the design flow efficiently puts forward a number of questions as they are required to be significant and likeable so as to deliver the result. Individuals are required to purchase-inside the personas and get to understand them if they are anticipated to outperform their aim. Personas are also required to be utilized on daily basis so as to impact the design flow. (G. and Pruitt, 2002) stated on the favorable application of personas at Microsoft: but in the end they produced various kinds of equipment's so as to broadcast the personas and guarantee that they are authentic portrayals. On the other hand, (Nieters, J. E., Ivaturi, S., 2007) stated how utilizing the equipment needed some amount of spontaneity so as to construct significant and likeable personas. These accounts display that in usual procedure, personas are frequently utilized in various and at times skillful methods, and are viewed as soft instead of harsh tool. (Milham, 2006) present an iconoclast glimpse of personas and elaborate the technical shortcomings and realistic restraints, which they state weakens the efficacy of the tool. From the technical point of view, they insist personas are not easy to validate and characterize only a limited fraction of the expected community. From technical shortcomings they state that it is obscure how personas are settled with other information and who is accountable for understanding them. Form the present literature regarding personas the tool is controversial with different pros and cons.

3. Process

Our intention when utilizing the persona technique was to investigate the needs, behavior of smokers in daily activities. Our main aim was to design a smoking cessation tool by considering users as partners in product development, understand what people think, feel and dream and envision expected upcoming possibilities of product use.

Initially we thought of comprehending cognitively and efficiently the end user's requirements and render this perception into user-centered products and assistance. It draws on information about the user and his or her everyday life, and includes inspiration for design. We decided to interview people who are smokers and to come close as possible to effective smoking cessation application, we chose both heavy and light smokers in our study. We found it suitable to understand what makes people uphold a continuous interest. In this study we utilized the approach of matching technology properties with specific human interests and how to transfer them to the design space of the technology.

Our motivation for focusing on people who are smokers is not only to design a simple mobile application. Instead it is done to understand the core features of this specific human interest and transfer and extend it into mobile application that will assist them in the best manner and encourage them to quit smoking. Here, smoking now and then could for example involve more general underlying human motivations such as stress, show-off, social networking etc. Thus, we do not intend that the smoking cessation tool would help the smokers to get rid of the habit overall. Rather, they would provide us with knowledge about underlying behavior for their personal interests, their expectations that can match what is possible to build with current technology. We believe that some of the core motivations for their interest can be transferred into a mobile application which will divert their attention and slowly help them to reduce the tobacco intake.

3.1 Interviews

There are number of capable information sources encourage engendering, including survey, interview, observation, circumstantial audits and web analysis with other research works using multi-mechanism. In this study observation, interview was utilized to increase research genuineness and accuracy. The study was conducted with 19 smokers between the age of 19-55 years in university campus. The questions we aimed to answer include:

- What are the expectations of the smokers from the smoking cessation mobile application
- What really made them develop the habit
- Their background, family, social interaction
- What are their normal routine activities
- Why the users were interested in quitting

Both male and female participants were interviewed in the study. All of the participants were well educated and spoke languages Mandarin, English, Bahasa Malay. About 50 per cent smokers started smoking their first cigarette between the age of 16 and 25 years old, 35 per cent

started smoking when they were less than 15 years of age and 15 per cent when they were above the age of 25. 55 per cent did not have a healthy life-style as a teen and could easily get cigarettes during the experimental phase. Amongst the smokers (about 75 per cent), someone from the family smoked which influenced some and some did not get influenced. While growing up about 45 per cent of the smokers noticed anti-smoking messages on television, radio, posters, newspapers, magazines or movies, 20 per cent were not sure an 10 per cent did not notice at all. Almost 70 percent smoked 2 packs of cigarettes per day, 40 per cent smoked more than 15 cigarettes and 25 per cent smoked between 5 and 15. Majority smokers started smoking after 15-30 minutes of getting up from bed in the morning and some within 5 minutes of getting up from bed. Equal number of participants wanted to quit smoking but some were not ready to quit. Half of the participants were concerned about their health but still some did not pay attention towards their health at all.

Some participants had seen a doctor engendering a thoughtful viewpoint of their handled personal interest practice as well as their self-management condition. Protocol questions attracted smokers' ability of self-management, reactions and concepts for functional smartphone applications restraints and disputes in self-management and technological propensity. Some Interviewees were specialists and people from health facilities. As care administers, medical providers handled the recognition and concept of smokers care needs, application of traditional protocols and amendment of conformity affairs in certain ways that might not be obvious to the smokers themselves. Interview questions focused on the affection administration mechanism, patient disputes and conformity affairs as well as the capable character and determination to improve current usual procedures. The review provided a useful concept of the smokers and their viewpoints.

3.1.1 Development of Personas

In this study, the subjects were not uniform for smoking cessation application design determination. The focus groups, interviews and other kind of data collection ablaze ordinary characteristics including circumstantial distinctness in viewpoint, understanding and expectations between the smokers. The design, ratification of this smoking cessation application is implicitly challenged acclaimed design and experiences noticeable in data collection (For example, "I don't count the number of cigarettes I smoke per day.") backed by others (For example, "This application would be helpful!). It is suggested to identify and react to these alternatives and objections in design concerning technology. Some of the habits of smokers are highlighted as well as the emphasis on the requirement to identify health care and demographic components when developing the smoking cessation application.

On the basis of the resulting clusters, two personas were different and the personalities were created and named: Mr. Hassan and Angelina. At each stage, each persona got their first preliminary description (or scenario), focusing more on their personal behavior, daily habits and

their expectations. Here, the expectations of the smokers would transfer to a mobile application. In this phase each description was also enriched with imaginary ideas about the persona in order to enrich and complement the interview data.

After the initial phase of developing personas we refined them as personas and further sorted out details about their interaction with the application. Several brainstorming sessions were held, focusing on making the personas as different as possible from each other both in terms of their interest in mobile application and in their interaction with them.

Expectations and the form of mobile application as well as their technical implication were specified and refined in the last phase of creating the personas when their overall role had been established. During the process we used large notice boards to re-arrange notes and exclude less interesting ones. The written description of personas were also updated throughout the process.

4. Results and Discussion

Below we describe the personas created during the process: Mr. Hassan, Angelina. Their scenarios illustrate their background, overall behavior, daily activities. We also present some technical implications for the smoking cessation mobile application.

4.1 Mr. Hassan

Mr. Hassan is 28 years old and has moved to Malaysia in order to complete his postgraduate studies in engineering faculty from University Putra Malaysia. He lives outside campus with his wife and two kids. Most of the people close to Mr. Hassan know well about this smoking habit and encourage him to quit.

Mr. Hassan smokes five times a day or more. He smokes 10-25 cigarettes per day. Normally he spends less than RM 100 per month for cigarettes. Sometimes he would spend more than RM 100. He would start smoking at least 30minutes after wake up and again smoke 30 minutes before sleep. He believes that smoking probably could be harmful to health but any kind of assistance to manage behavior would be helpful. He attempts to quit smoking in the near future in terms of family, health concerns, costs and so on. He owns a smartphone and uses it for entertainment. He is interested to quit smoking and according to him smoking cessation mobile application could assist him in quitting. This was illustrated by Mr. Hassan:

"*I decided to try smoking because one of my good friends very close to me used to smoke often and I wanted to know how a person feels smoking cigarette. I was not too much into this but seeing while smoking made me to attract towards it. So, I decided to try out! Now, I can't go days without cigarettes and being with people who smoke encourages me to take up the most. But I have to be committed to myself because I know that I can't change for people but I will have to change for myself"*

It was this curiosity that provoked Mr. Hassan to try out the habit and he still holds on to it. He likes to read everything about the health effects of smoking on internet pages or magazines; anything that crosses his path in order to give up the habit. He also frequently visits other sites to find some positive points that would encourage him to give up the habit. So far, reading alone did not help enough to divert him but an effective smoking cessation mobile application with a number of options of various types could assist him.

Technical Implication

The mobile application is equipped with a wide variety of options that will help the smokers identify behaviors that give them pleasure and can be used instead of smoking. It presents an exceptional impression into the prevalence of smoking, the time between the last cigarettes smoked, what friendly atmosphere prompts the habit, as well the aggregate daily/weekly/monthly history of smoking. It is just like a fitness app, but signified to support those vigorously trying to quit. The app includes other components of multimedia content besides the static content, such as video, music, cartoon and even games. It presents data on the advantages of being smoke free, such as financial advantages (amount of money saved daily, weekly and annually and achieving financial goal) and health advantages (heart rate, Oxygen level, reducing risks of cancer etc.). It presents universal motivational material such as for present health, for finances, for job prospects, for appearance, for social needs and for others. It provides link to some religious videos, educational sites.

4.2 Angelina

Angelina is 21 years old and lives in Malaysia with her mom and two sisters. From her childhood her dad used to take her around with him where she would notice all his friends smoking. When she was 15 she decided to try out the smoking habit. Smoking has become an important part of her daily life and makes her feel relaxed and strong.

Whenever she is stressed out she would smoke 4-5 cigarettes at a time. According To Angelina, smoking is cool and every day she would smoke soon after getting out of bed. During the day she would smoke at different times and would spend a good amount on purchasing cigarettes. She smokes up to 15 cigarettes per day and sometimes more than 15.

Angelina made multiple attempts to quit smoking soon after she faced health problem and had different levels of commitment for each quit attempt. According to Angelina,

"*I noticed irregular heart especially after walking and climbing stairs, I can't workout anymore. I also consumed some drugs along with smoking during the parties and i guess it is hard for my hard to assimilate all that. Some of my family members do have heart problems so I decide to give up smoking and consuming drugs. These things cost a lot and I know it is not good at all. I would get into a stressful situation and look around if someone had a cigarette. I tried to quit*

which I can't really count, maybe more than hundred times. I felt really sick so I never tried after that. I need valuable cessation tool that would be interactive and distract me effectively so as to save myself for my family!"

Angelina developed the attraction when she used to attend social gatherings with her father. To avoid health disruptions she is interested to quit smoking before she develops serious problem. She needs an interactive app possessing some efficient features that would alert her form time to time and would divert her attention when craving to smoke. Angelina possesses latest smartphone and uses it for both professional and personal purposes.

Technical Implication

The mobile application is designed with the intention to alert user with the notification feature. The notification characteristic will permit the app to interact very often with the user. A collection of notifications have been employed that can acquaint users to check the app when it has not been used freshly. It can applaud users when a new prize or anniversary is opened, can present academic possessions and information, alert users of app characteristics that the user may not know (For example, "Did you know that you can alter/modify your quitting scheme?"), present evolution knowledge (For example, "Did you know you were progressing to save $4,367 this year?"). Notifications should pop-up and progress to the notification centre that are available in smartphone or mobile gadgets. Furthermore, app users should have the choice to accustom the frequency and to either open or turn-off these notifications

Smoking cessation app should not be completely dependent on internet connectivity and be accessible to users for auditing performance. Main fundamentals of logging in data, observing improvement and visuals, and reading information can be obtained without data plan. Extrinsic connections and supports can be obtained when an internet connection is accessible. On addition, the content that a user has logged into the app while offline can be restored to the server once online. The app also proves advantageous to the user from having central interruptions for example, puzzles, quizzes that request users entertaining questions and contemplates elements that had not been given attention before. These questions should not inevitably be precisely related to smoking as the objective should be to divert user's attention.

Even though our personas are fictitious individuals but they have been established on actual information and their explanation is prepared on actual requirements and expectations of individuals. Nevertheless, personas are produced by our vision and present expected but not precise design consequences. The personas presented in this paper notify the design of smoking cessation app that would assist the smokers in an effective manner. An attainable aspect of smoking cessation application will engage smokers in real time and wherever they are. In our scenario with Mr. Hassan we display the individual expectation can lie in what the cessation app

can present or conclude in its portrayal as a design object. In such a scenario we elucidate different features of smoking cessation application designed that would support smokers in quitting attempt for various stages of behavioral change using technology. Mr. Hassan's behavior and expectations were examined to see whether it was effective in persuading smokers to modify their smoking habits. In our scenario with Angelina, the role of smoking cessation mobile application is to act as a reminder and make her aware of the updates in the app, distract her effectively on time when craving to smoke in order to help her to give up the habit. This way the smoking cessation toll acts as an encouragement and kind of an indirect device that interacts with people sharing the interest of giving up the habit. Our resulting scenarios show how the interviews with smokers interested in quitting to smoke affected the design outcome.

5. Conclusions

Smokers are the most outgoing and account topmost on the psychoticism rate. It is vital to design apparatuses for individuals who are not able to get rid of their behavior so as to possibly lower the injurious effects caused by smoking. Although smoking assists to subdue emphasis, but deficiency of abandoning may engender genuine health complications. In this study using personas and empathic approach it is concluded that the efficient development of the smoking cessation mobile application is important and would assist smokers in an outstanding manner. Smoking cessation application improves the efficiency and effectiveness of smokers and encourage them to change their daily life activities which could have an impact on the habitual ailment concern.

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