

Domain Space and Requirements Gathering Report

Team Tango

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Synthesized Problem and Grand Challenge

We selected Precision Health as our interest under IU Grand Challenge because chronic diseases can be treated and cured if people are able to detect them early. The people who are affected by breast cancer are both men and women. For our project we are going to focus on women for our scope. More than 200,000 women get breast cancer and more than 40,000 women die from the disease. Our key issue is Breast Cancer among US women in 2017, there will be an estimated 252,710 new cases of invasive breast cancer, 63,410 new cases of breast carcinoma in situ, and 40,610 breast cancer deaths.

The purpose of our product is to make people aware of breast cancer. With this social computing product, we hope that women are more aware to detect breast cancer during the early stage. According to National Cancer Institute's SEER database, from 2007 to 2013, the 5-year relative survival rate for women with stage 0 or stage 1 breast cancer is close to 100%. Stage IV breast cancers patients have a 5-year relative survival rate of about 22%, so it is really important to detect breast cancer at an early stage to have a better chance of survival.

We focus on U.S. women from the ages of 20 to 50 because this is the domain that should be aware of breast cancer and prepare for detecting it at an early stage. These groups of women should have enough ability and background knowledge to support them to be more aware of breast cancer. Most breast cancer are found in women who are 50 years old or older, but breast cancer also affects younger women. About 10% of all new cases of breast cancer in the United States are found in women younger than 45 years of age.

About 1 in 8 U.S. women (about 12%) will develop invasive breast cancer over the course of her lifetime. For women in the U.S., breast cancer death rates are higher than any other cancer, besides lung cancer. As of March 2017, there are more than 3.1 million women with a history of breast cancer in the U.S. This includes women currently being treated and women who have finished treatments. About 40,610 women in the U.S. are expected to die in 2017 from breast cancer.

Breast Cancer has numerous health impacts on a woman's body such as pain in the breast, reddish skin around the breast area, swollen breasts with or without a rash, physical changes, nipple discharge, change in the size or shape of the breast, and thickening in the breast or under the arm. The chronic disease affects a woman's social life as the person is mostly tensed or irritated and remains worried about the recurrence of cancer. This will affect the lives of the children, family and friends. If the woman goes under mastectomy, then her social life will be the most impacted due to insecurities and lack of confidence. Mastectomy is the surgical procedure of removing a breast.

Findings

Based on our findings, we interviewed women who were between the ages of 20-50 years old. We interviewed four different people. Their ages were 21, 25, 48, and 50. All of our participants have heard of breast cancer. Most of our participants knew some symptoms of this cancer but not all of them knew what the symptoms were. The only symptoms they knew were your breasts hurt and that chemotherapy was a way to get rid of it. Some of them didn't even know enough information besides the name. Obviously, not everyone is aware what the symptoms are.

When people hear the word "cancer", they are very concerned. So we asked our participants if they have ever been concerned about breast cancer. All of them said that they were concerned because it is a hard disease to cure. Another reason is hygiene and hormones. Our participants believed that they are concerned about breast cancer due to keeping up with their hygiene and when they have their menstrual cycles. One of our participants believed that sometimes during her menstrual cycle, some of the symptoms are very close to breast cancer symptoms so she is always concerned about that.

Our participants have heard of a mammogram. We also explained to them what a mammogram was just in case they have never heard of it before. We told them that it was a yearly test that is done on your breasts to make sure that you don't have any symptoms of breast cancer. 3 out of the 4 participants have had a mammogram at least once but they don't get them that often because they are really expensive.

During secondary research, we found that there are home kits that people can buy in order to self examine themselves. Some of these home kits that we have found were very costly. We found a cheaper kit that was \$20 but then we found some that were around \$300. Since there is a wide range in cost, this could lead to people not being able to buy it. For one of our questions we asked if our participants have heard of home kits. Out of all four participants, only one person had heard of them but she didn't know the brand of it. During our research we didn't even know that there were home kits that exist, which means that they aren't advertised as often. All of our participants have done a self-examination before. They have either performed it themselves or they have gone to a specialist or doctor to check.

Post the interviews we analyzed the data we had and conclude that women at an young age need more information about breast cancer as they did not learn the necessary information related to early detection and prevention. While older women were more aware they didn't learn about the process of early detection. The participants were aware of the symptoms of the disease but lacked to know the prevention methods which caused the symptoms to occur. Thus we conclude that through our project we propose to help spread information and awareness about breast cancer by allowing women to learn about the various ways to prevent, detect and cure breast cancer.

Appendix

References:-

<http://www.nationalbreastcancer.org/breast-cancer-facts>

<https://www.medscape.org/viewarticle/583987>

http://www.breastcancer.org/symptoms/understand_bc/statistics

<http://pubs.sciepub.com/ajcp/3/1/4/>

<https://www.cancer.org/cancer/breast-cancer/living-as-a-breast-cancer-survivor/emotions-and-breast-cancer.html>

<https://www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/breast-cancer-survival-rates.html>

Interview Questions:

Pre-test questions for participant:

Age: 48, 50, 21, 25

Gender: Female, Female, Female, Female

The purpose of this interview is to gather information about breast cancer. We are trying to see how much people know about the awareness of breast cancer. We will ask you some questions. If you need a break at any time, please let me know.

Are you ready to begin?

Grand Tour:

1. Have you heard of breast cancer? yes. Have heard before. yes. yes

a. If so, what do you know about it?

It's a dangerous disease, and will affect the appearance after surgery. Just heard its name but don't know what's the symptoms of this diseases. It's a thing that we should all be educated about. We should also know what exactly it is. It is a type of cancer. Mostly in females. It affects our bodies. There is a few females who get rid of some of their breasts. Chemo therapy and meds. Women of ages past 25 years have a higher risk. Women at younger age should be aware of it. In school she learned about it but no preventions

2. Have you ever been concerned about breast cancer? Yes. Sure! Yes. yes

a. if so, why or why not are you concerned about it? it is dangerous.

Because cancer needs very very much to cure! And also it is usually very difficult to cure and be fully recovered. The most important is hygiene. First step to prevent from getting rid of breast cancer. some

difference in your body during menstrual. Never knows if it is just hormonal symptoms. Women may not know the difference

Experience:

1. Have you or someone you know experienced breast cancer? Yes. No. Yes.
yes
 - a. if you feel comfortable talking about it, could you explain? I'm not quite familiar with them. I think if the disease is found in its early stage, it can be cured. There was a family member, she was diagnosed with breast cancer. She went through a couple of chemotherapies. Got operated on after a couple of chemos. if you feel comfortable talking about it, could you explain? Can't share experience. Grandmother's sister she is 80. She had breast cancer and they had to remove the breast
2. What would you do if you suspect to have breast cancer? Go to the hospital, and do an examination. Ultrasound can detect it and pathological sections is the most accurate way. Go to see a doctor to make sure. I would go to a doctor and consult. Follow their orders to get rid of it. I would go to the doctor to learn more about it. What all would I need to do apart from medication. Such as yoga therapies,
3. Have you ever received a mammogram? A mammogram is an x-ray that examines your breast for cancer Yes. Yes, I have. no. Yes
 - a. if so, how often do you receive one? Once a year, at the same time when doing annually physical examination. Every 4 years. Not very often, don't have time and very expensive. Had it once and it was normal
4. Have you ever done a self-breast examination? Yes, and it's very easy and convenient. Yes, I did. yes, once due to a medical issue. Yes regularly but person can be confused about hormonal change or if it is breast cancer related
5. Have you used an at home kit to help test breast cancer? No. No. I even don't know these kits. no. haven't heard of it either. Never heard of it before. Doesn't stand any chance of me to use it

Example:

1. If you could prevent breast cancer, what would you do? Yes, of course I want to do something to prevent it. But I will also consider side effect. I want to choose a way with least side effect. I will take care on diet, like I would eat more kelp, buhay army grass, because I heard from that these two food is good at release the breast nodules or hyperplasia, but I have no ideas on how much one time and how often should I eat. Hygiene would be something we should follow. Something to prevent breast cancer. Don't know the problem

but there are tips for preventing it. Such as not wearing bras all the time or exercising but doesn't know how affected

2. Do you use some kind of app that tracks your health condition? Yes. No.no. No, the app can do what i can do so i don't like to use it. Doesn't think they are useful but in the future i might
 - a. if so, why do you use that app to track your health conditions?

Search some symptom on the internet and help identify what happens to me. app but believe in regular medical check ups. Every 6 months or so to keep up to date with health issues

- b. how does the app, help you be aware of your body, aware of breast cancer, and maintain good health? Help broad the knowledge of different diseases and if there are some similar symptoms happen to me, I can be aware of them. And it will teach me how to do in my everyday life to keep healthy.If she did use an app, I would be helpful. Not something she should follow
3. if you don't use an app to track your health, would you consider using such kind of apps to help you maintain good health? Yes, something like recording menstruation. No, I am health now, and I don't know if the app will be complicated for me. And I didn't hear from this kind of App. If someone has used and recommends to me, maybe I can consider to use. consulting with a doctor to talk to. It should have regular track data. Example every month have soreness,
4. What kind of function or feature would you like? Maybe some humanised design. I cannot figure out, I totally have no idea. consulting with a doctor to talk to. i would put in data of when it occurs. It should be alert if there are pains but it shouldn't automatically say oh you have breast cancer. It should already know my age and everything. Should know the regular symptoms in a person. For girls, when they first use bras, they should know what material, how they should use it. Sleeping positions that should be good to prevent breast cancer. They should be clear on what they are

Native-language:

1. Based on the symptoms for breast cancer, such as breast pain, skin irritation, discharge, and swelling, in your Native-language how would you explain this?

She is a nurse working in operating room but not a specialized department for breast cancer. As a nurse, I know the most important thing to cure cancer is to detect it as early as possible, it's easier to cure the cancer in an early stage. And patients need to wait for some time before receiving surgery because the number of beds in the hospital is limited. And they need to wait for the examination results too. Those processes may occupy patients a lot of time.

If i feel that I'm having a lump or thickening in my breast and its paining and also my breast are a bit a swelling up and there's itchiness too.

If I have to explain someone about my symptoms I would say them as I'm facing issue around my chest area and its paining. It's also reddish in colour and I'm being irritated because of itching.

The only way to cure breast cancer is to cut the lump together with muscle, lymph around it and even the whole breast. But if the lump is detected not to be malignant tumour, there is no need to cut other things just cutting the lump.

No specify for this, since I don't know the symptom at all, I just know the breast hurt...

If the ladies just had kids, there may not discharge that they should go see the doctor.