Project Design Phase-I – problem solution fit

Project Title: Classification Of Arrhythmia By Using Deep Learning With 2-D ECG Spectral Image Representation

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Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Who is your customer?
i.e. working parents of 0-5 y.o. kids

It will be useful to the doctor who specializes in heart issues, including arrhythmia, and conduct a variety of diagnostic tests to determine if you have an arrhythmia,

6. CUSTOMER CONSTRAINTS CC

What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.

The most effective way to diagnose an arrhythmia is with an electrical recording of your heart rhythm called an electrocardiogram (ECG). By using 2d images and other deep learning arhythmia is detected with the help of echo cardiogram

5. AVAILABLE SOLUTIONS AS

Which solutions are available to the customers when they face the

or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking

Treatment for heart arrhythmias may include medications, therapies such as vagal maneuvers, cardioversion, catheter procedures or heart surgery

Explore AS, differentiate

Focus on J&P, tap into BE, understand R

2. JOBS-TO-BE-DONE / PROBLEMS J&P

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

Arrhythmias require emergency care...they can damage your heart or brain, or even cause death.
if left untreated.

9. PROBLEM ROOT CAUSE RC

What is the real reason that this problem exists?
What is the back story behind the need to do this job?
i.e. customers have to do it because of the change in regulations.

Behind this problem there are many causes like Blocked arteries in the heart .Changes to the heart's structure, such as from cardiomyopathy, Diabetes, High blood pressure. Infection with COVID-19. Overactive thyroid gland (hyperthyroidism).

7. BEHAVIOUR BE

What does your customer do to address the problem and get the job

i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering wor (i.e. Greenpeace)

The customer just need to visit our web application and selects the image which is to be classified. The image is fed into the model that is trained and the cited class will be displayed on the webpage.

Focus on J&P, tap into BE, understand R

IDENTIfY strongTR&EM

3. TRIGGERS

T

R

What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.

Many times, arrhythmias are not life threatening and can be caused by stress, caffeine or other factors. But when accompanied by other symptoms, such as feeling faint, dizzy or short of breath, it could be a sign of a more serious problem. hence the hospitals having the appropriate technology can help reduce the risk of death rate and diagonize properly

4. EMOTIONS: BEFORE / AFTER

E

M

How do customers feel when they face a problem or a job and afterwards?
i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

A person may feel dizzy, faint, and light headness. If not treated the fibrillation on time can damage the heart, brain, or other organs. This can lead to life-threatening stroke, heart failure, or cardiac arrest.

10. YOUR SOLUTION

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L

If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality.
If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.

We will do an effective electrocardiogram (ECG) arrhythmia classification method using a deep two-dimensional convolutional neural network (CNN) which recently shows outstanding performance in the field of pattern recognition. Every ECG beat was transformed into a two dimensional grayscale image as an input data for the CNN classifier. Optimization of the proposed CNN classifier includes various deep learning techniques such as batch normalization, data augmentation, Xavier initialization, and dropout. In addition, we compared our proposed classifier with two well known CNN models; AlexNet and VGGNet. To precisely validate our CNN classifier, 10-fold cross-validation was performed at the evaluation which involves every ECG recording as a test data.

8. CHANNELS of BEHAVIOUR

CH

8.1 ONLINE

What kind of actions do customers take online? Extract online channels from #7

In online the customer just need to visit our web application and selects the image which is to be classified. The image is fed into the model that is trained and the cited class will be displayed on the webpage.

8.2 OFFLINE

What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

In offline the customer only needs to get the photo of the arrhythmias which then can be processed online to get the desired output.

Extract online & offline CH of BE