Project Title: Classification of Arrhythmia By Using Deep Learning With 2D Spectral Image Processing

Project Design Phase-I - Solution Fit Template **Team ID:** PNT2022TMID35787

Define CS, fit into CC

1. CUSTOMER SEGMENT(S)

CS

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

Customers may include

- Medical professionals in their late 20s to their age of retirement
- Hospitals dealing with diagnosis and treatment of cardiovascular diseases
- Patients suffering from or at the risk of exhibiting symptoms Cardiovascular diseases

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.

- Classifying of Arrhythmia is an arduous task and time-consuming.
- Prolonged diagnosis delays treatment for patients which may prove to be critical in

5. AVAILABLE SOLUTIONS

AS

Which solutions are available to the customers when they face the problem

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

They had to use their field expertise to classify the disease based on ECGs,although it is done by experts,it requires too much manual labour and time.

Explore AS, differentiate

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

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.

-Reduce cost of manual labour
-Reduce time taken to diagnose
-post care treatment
-Increase accuracy of detection

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.

Increasing cases of CVDs require fast diagnosis for treatment,thus,facilitating the need for an automated solution

7. BEHAVIOUR

BE

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

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

-Try approaching medical professionals who are friends or relatives in order to get the work done faster.

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

Identify strong TR & EM

3. TRIGGERS

TR

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

-When other hospitals use an automated solution,customers tend to go for it.

-Patients seek hospitals that allow them to pay less amount for the treatment but are also efficient.Automated solutions may bring about lower costs.

4. EMOTIONS: BEFORE / AFTER

EM

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.

-Customers feel helpless and lost while searching for a solution but after obtaining it they tend to be more satisfied and be at peace.

-When they are in a profound search for a solution they find themself anxious towards the problem which distracts them from finding the perfect solution .They research by themselves in order to find the perfect solution and they will give a positive appreciation to themselves and try to enhance their work on a big scale.

10. YOUR SOLUTION

SL

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.

A CNN model combined with LSTM is used to predict the type of Arrhythmia and classify it. A lightweight CNN model is to be used which may be further extended to hardware applications such as wearables for future innovations without compromising the accuracy or real time detection speed.The project aims to combine it with an user interface where the user can upload an image and the output is predicted.

8. CHANNELS of BEHAVIOUR

CH

8.1 ONLINE

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

-Online queries are made difficult because of network traffic and server down issues.This may cause user to raise complaints against the firm or hospital.

-Customers may tend to diagnose themselves by googling about their symptoms and start panicking.

8.2 OFFLINE

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

-It's easier to take action offline because the patients can directly visit the firm .There will be no means of miscommunication and technology is not a barrier here.

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Identify strong TR & EM